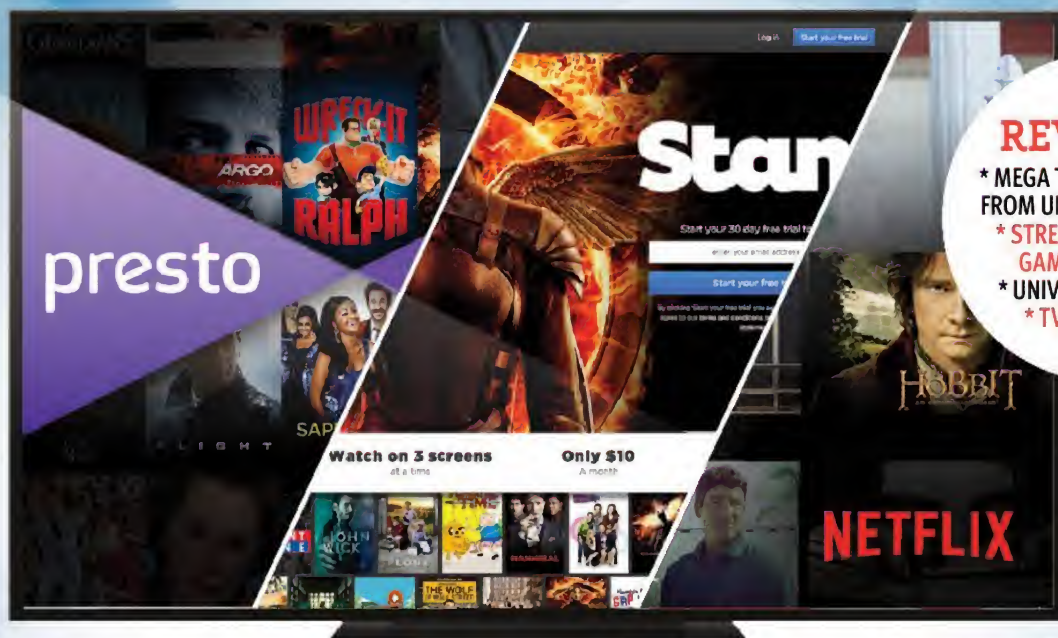


◀ iPad Pro **VS** SURFACE BOOK ▶

# TECH AUSTRALIA life

• IT'S TECH SMARTS MADE SIMPLE •

ISSUE 16 | JANUARY 2015 | TECHLIFER TECHLIFER TABLET EDITION IN APPLE NEWSSTAND & GOOGLE PLAY



## REVIEWED!

- \* MEGA TV BUYER'S GUIDE: FROM UNDER \$1,000 TO 4K
- \* STREAMING BOXES vs GAMES CONSOLES
- \* UNIVERSAL REMOTES
- \* TV SOUNDBARS

[ CREATE YOUR OWN ]



# STREAMING HEAVEN

**BUILD THE ULTIMATE AUSSIE STREAMING TOOLKIT & GET THE BEST GEAR, GADGETS & APPS!**

## BUYER'S GUIDE TOP TECH RECOMMENDED **NO TURKEYS IN HERE**

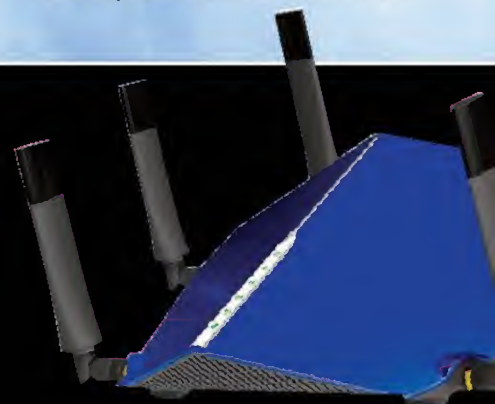
28 CATEGORIES INCLUDING:  
\* SMARTPHONES & TABLETS  
\* LAPTOPS & PC PARTS  
\* ACCESSORIES & PERIPHERALS  
\* AUDIO GEAR, CAMERAS  
+ MUCH MORE!

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\* TRULY SECURE YOUR COMMUNICATIONS  
\* CONTROL YOUR WHOLE HOME WITH A SMARTWATCH  
\* TEACH WINDOWS UPDATE WHO'S BOSS

## LATEST GEAR LABS TESTED BEASTLY D-LINK ADSL ROUTER **DOES ITS SPEED MATCH ITS SIZE?**

\* HP'S STAR WARS LAPTOP  
\* SEXIEST SMARTWATCH EVER (FROM THE COMPANY YOU'VE NEVER HEARD OF)  
\* SMARTEST BROADBAND ROUTER WE'VE TESTED





# IEEE 802.11ac Wireless and VoIP Solution for NBN (and non-NBN) Home and Business Networking

**DrayTek**  
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**32x**

VPN



**50x**

VPN

## Vigor2860ac / Vigor2860Vac

VDSL2/ADSL2+ & Gigabit-WAN VPN Firewall Router

- ✓ Multi-WAN with VDSL2/ADSL2+, Gigabit Ethernet WAN and USB ports for 3G/4G dongles
- ✓ Six Gigabit LAN ports with multiple subnets and 50,000 NAT sessions
- ✓ Two USB ports for 3G/4G USB modems, network printer, storage and USB thermometer
- ✓ Integrated IEEE 802.11ac wireless Access Point; dual band; up to 1300Mbps throughput
- ✓ VoIP (2 x FXS and 1 x FXO Line Port) for Vigor2860Vac

## Vigor2925ac / Vigor2925Vac

Dual Gigabit-WAN Broadband VPN Firewall Router

- ✓ Multi-WAN with dual Gigabit Ethernet WAN and USB ports for 3G/4G dongles
- ✓ Five Gigabit LAN ports with multiple subnets and 50,000 NAT sessions
- ✓ Two USB ports for 3G/4G USB modems, network printer, storage and USB thermometer
- ✓ Integrated IEEE 802.11ac wireless Access Point; dual band; up to 1300Mbps throughput
- ✓ VoIP (2 x FXS and 1 x FXO Line Port) for Vigor2925Vac



**2x**

VPN



## Vigor2132ac

Gigabit-WAN Broadband VPN Firewall Router

- ✓ Integrated IEEE 802.11ac wireless Access Point; dual band; up to 1300Mbps throughput
- ✓ 1 x Gigabit Ethernet WAN interface with security object-oriented SPI firewall and QoS
- ✓ 4 x Gigabit Ethernet LAN ports with 30,000 NAT sessions
- ✓ 2 x USB ports for USB printer, storage and USB thermometer

## VigorAP 910C

802.11ac Ceiling Mount Wireless Access Point

- ✓ IEEE 802.11ac wireless Access Point with PoE PD port and ceiling mount housing
- ✓ Supports multiple SSID with bandwidth management per SSID
- ✓ Equipped with advanced central wireless management (AP Management)
- ✓ Up to 866Mbps Wi-Fi throughput



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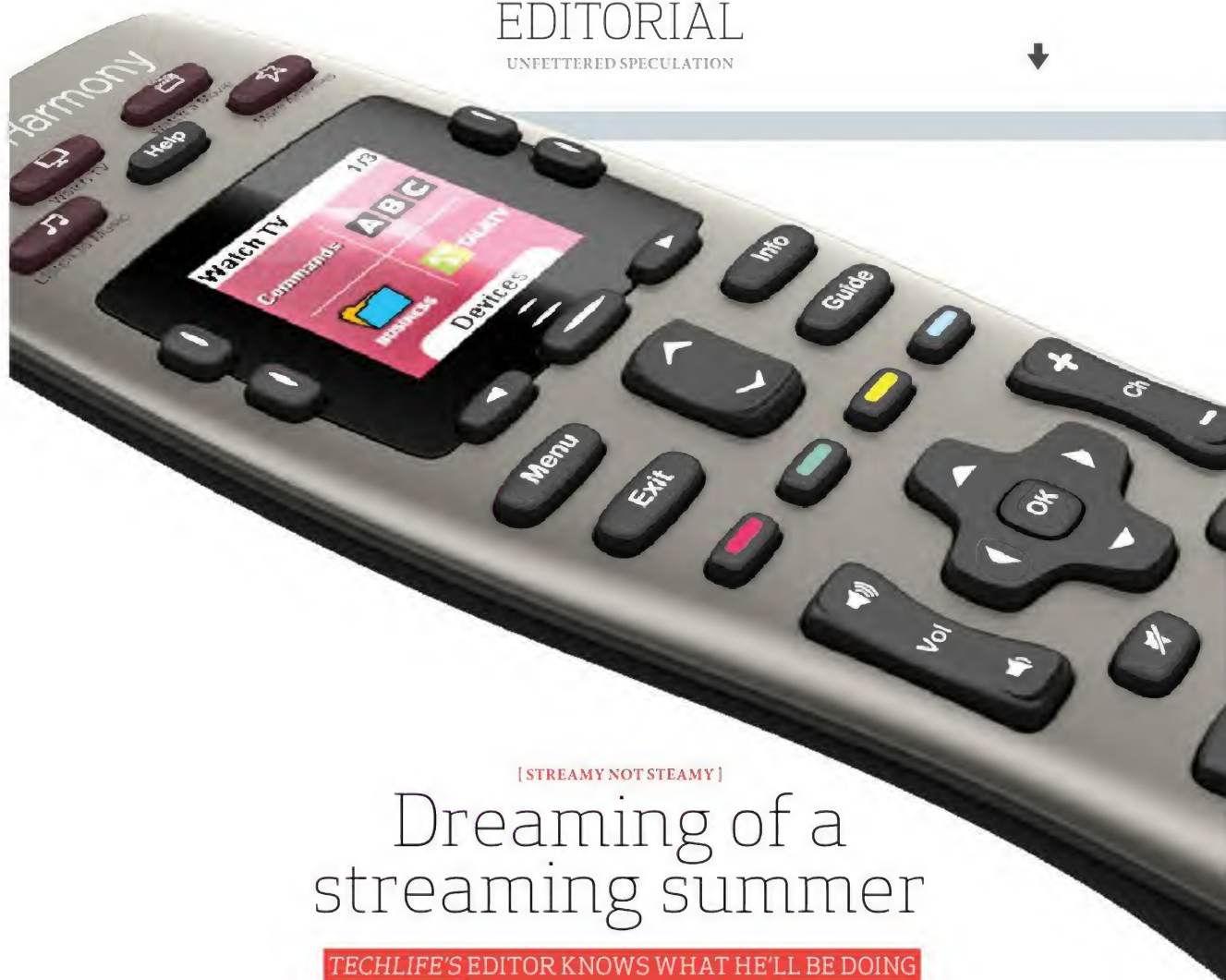
sales@i-lan.com.au

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## EDITORIAL

UNFETTERED SPECULATION



[ STREAMY NOT STEAMY ]

# Dreaming of a streaming summer

**TECHLIFE'S EDITOR KNOWS WHAT HE'LL BE DOING ON HIS SUMMER BREAK...**

[ DAN GARDINER ]

BRITISH DICTIONARY-PUBLISHER COLLINS named 'binge-watch' as its top word of 2015, and if you're anything like the team here at *TechLife*, it'll be a term that you've rather rapidly become familiar with during 2015. The annual Australian summer holidays are, of course, a great time to take advantage of this new tradition — in part because there are now many more good streaming services available to Australians (many are even completely legitimate).

Beyond viewing those streams on a tablet, smartphone or PC, though, figuring out where and how you can access Australian services can become a little unclear. That's something we've aimed to make at least a bit less murky with this month's cover story, in which we've rounded up the best streaming devices currently on offer, compared TVs on their streaming smarts (as well as arguably more important things like picture quality and value for money!) and uncovered some of the best accessories to enhance your binge-watching experience, in the form of soundbars and universal remotes.

Streaming is such a huge area, however, that there are undoubtedly some tricks, tips and nifty gear that we haven't covered, so if you've got a favourite app, site or cool tool that we've missed, or an neat technique that you reckon everyone should be using, then please write in and share it with us. The best will get published in the mag (with full credit going your way).

Of course, the summer break shouldn't be all about streaming... there's plenty of other tech out there with which you can spend your time too! The tail end of the year is always a big time for new product launches, so if you picked up some tech goodies this holiday season, let us know how they're treating you and what specifically you love and/or loathe about them.

We'll see you next month, but in the meantime, on behalf of the *TechLife* team, we hope you have a great break! ■

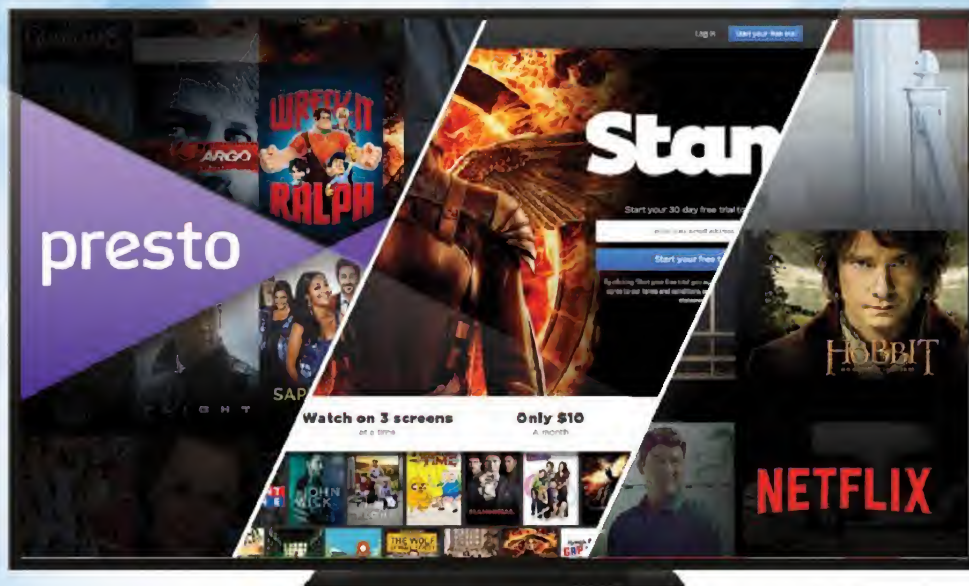




# WELCOME

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[ CREATE YOUR OWN ]



# STREAMING HEAVEN

**BUILD THE ULTIMATE AUSSIE STREAMING TOOLKIT & GET THE BEST GEAR, GADGETS & APPS!**



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GAMES

Fallout 4, Assassin's Creed: Syndicate and more.







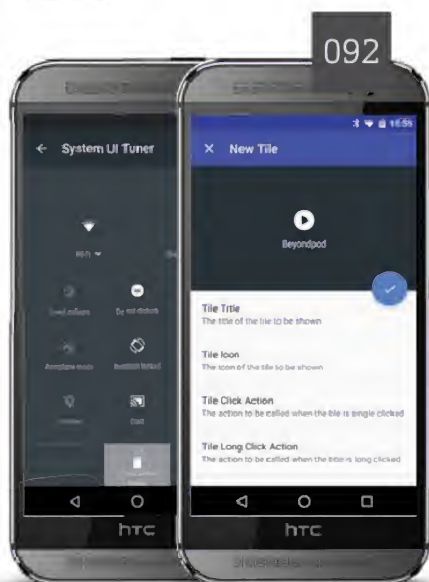
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The best tech products



044



[ DOWNLOADS ]

# Exclusive software

**FULL-VERSION COMMERCIAL SOFTWARE EXCLUSIVELY FOR TECHLIFE READERS. THIS MONTH WE'VE GOT TWO GREAT TOOLKITS & ONE FULL-VERSION PROGRAM TO HELP YOU GET THE MOST OUT OF YOUR PC:**

**ASHAMPOO BURNING STUDIO 2016, ABELSOFT KEYDEPOT & 4 GREAT VIDEO EDITING TOOLS**



## ASHAMPOO BURNING STUDIO 2016

DUPLICATE AND IMPRESS WITH PREMIUM BURNING TOOLS.  
FULL VERSION WORTH \$39.99

Many users are tired of over-complicated CD burning applications that are getting harder and harder to use. Sometimes, you can waste most of your time just trying to find a function. Ashampoo Burning Studio focuses on what you want — to burn discs quickly, easily, with maximum quality and minimum hassle. It includes everything you need to be able to do that, and it excludes everything that could get in the way.

Head to [www.ashampoo.com/techlifemagazine](http://www.ashampoo.com/techlifemagazine) to download your free version of Ashampoo Burning Studio 2016.



## ABELSOFT KEYDEPOT

MAKE PDF FILE SIZES MANAGEABLE WITH ABELSOFT PDF COMPRESSOR.  
FULL VERSION WORTH \$39.99

KeyDepot allows you to save all your login information in clear, self-defined categories. KeyDepot stores your password data using the AES-256 algorithm, which is approved in the US for state documents classified top secret. Users have the option to save personal data in the cloud, therefore allowing access to your passwords from a number of devices.

Head to [www.techlife.net/exclusives](http://www.techlife.net/exclusives) to download your free version of Abelssoft KeyDepot and use the password **January16a** to unlock the ZIP file.

## TOOLKIT: 4 GREAT VIDEO EDITING TOOLS

[WWW.TECHLIFE.NET/EXCLUSIVES](http://WWW.TECHLIFE.NET/EXCLUSIVES)

### KATE'S VIDEO TOOLKIT

There's nothing too surprising in Kate's Video Toolkit, but it does provide some basic but useful editing features. Trim files or join them, link two videos with a transition or create a sequence of videos with a custom soundtrack. There's even a simple file format conversion tool. There are plenty of limitations, too (you can't maximise the program window to use your full screen resolution, for instance), but Kate's Video Toolkit is extremely easy to use. If your editing needs are simple, it could be a great choice.

### AVIDEMUX

Avidemux is a small but capable open-source video editor that can help you join clips, cut them

(without re-encoding) and apply a lengthy list of useful filters (add logo, crop, flip, rotate, resize, sharpen, remove noise, tweak brightness, contrast colours and more). While this sounds basic, there are lots of options and fine controls to help make everything go as you expect, and there's an excellent online wiki that documents everything, too. Avidemux is well worth a look, if you're happy to spend a little time learning how it all works.

### VSDC FREE VIDEO EDITOR

Non-linear video editors can take some time to learn, and VSDC Free Video Editor is no exception (a lack of useful documentation doesn't help either). Once you get past this fairly significant hurdle,

it's almost plain sailing as the set of tools on offer is definitely on par with the other free video editing suites out there. When you have completed your project, there's even the chance to bring it to mobile devices or burn it to disc.

### LIGHTWORKS

If it's real editing power you need, then Lightworks has the biggest set of features among the free pack. Its feature-packed timeline, strong multicam support, realtime effects and smart trimming tools are so impressive, in fact, that the program has regularly been used to help produce top Hollywood movies such as *Mission Impossible* and *Batman*.

# TECHlife

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## THE WALL

GUFF AND STUFF

[ COME ON, HAVE YOUR SAY! ]

We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to [techlife@futurenet.com](mailto:techlife@futurenet.com). All correspondence becomes the property of *TechLife* and is subject to editing. Letters must include full name, street address, suburb, state and phone number to be considered for print publication. Address and phone details will not be published.

+

"COUPLED WITH THE POSSIBLE FIRE DANGERS I'VE BEEN READING ONLINE RECENTLY, I AM WONDERING WHETHER THE FIVE-STAR RATING WAS A LITTLE HASTY, GIVEN THE SAFETY RISKS NOW ASSOCIATED WITH THESE DEVICES."



Reports of mini-Segway 'gliders' seem to largely be caused by overcharging the devices. All the reports we've read have been out of the US and UK, but to be safe we'd suggest not leaving one of these plugged in once it's finished charging.



## Gliding difficulties

I read with some interest Joel

Burgess's five-star review of the Kaiser Baas Revo Glider in last month's issue. I've owned one for several weeks and cannot seem to board the gadget without falling off. Often, when I put one foot on, it accelerates rapidly in that direction. The only way I have managed to board the gadget without incident is to softly leap onto it, but I'll mostly fall straight onto my bottom. Coupled with the possible fire dangers I've been reading online recently, I am wondering whether the five-star rating was a little hasty, given the safety risks now associated with these devices.

[ REGINALD JONES ]

**Ed replies:** Yes, it can be a little tricky. The least skilled of our office staff Revo-riders utilises the end of her desk to board the Revo. She informs me that it is a very stable way of getting your balance in the early stages before taking to the in-office track. While it can feel a little wobbly at first, it's just like learning to ride a bike. It is worth mentioning, though, that the Revo Glider does have two modes — Beginner and Advanced. When turned on, the Revo automatically turns to Beginner. Pressing and holding the power button until you hear an extended beep will initiate the Advanced mode.

In regards to the safety issues, the instances of fire appear to focus around the overcharging of the units. The Revo Glider takes approximately

three hours to fully charge. The manufacturer does not recommend that the charging exceed this time and Kaiser Baas stresses that it should not be left charging unattended. Once fully charged, remove the charging cable from both device and wall socket, then let the fun begin!



## e-reader dilemma

I was thinking of getting my partner an e-reader for christmas and was surprised to see that the Kobo Aura H2O pipped the Kindle Paperwhite and the Voyage.

Though Kobos have been around for some time, I always thought they were inferior to the Kindle offering but will now seriously consider that added waterproof features and the upgradable microSD card slot. The integrated pocket app on the Kobo is also really intriguing. I've often wished I could read some longer web articles on my Kindle. The only thing they need now is to make newspaper and magazine subscriptions available. Thanks for the tip, I might even have to swap to Kobo myself.

[ MATT BARTLETT ]

The choice between a Kindle or Kobo e-reader isn't as black and white as it may first seem...

... followed by my partner. I like it by now by now had been surprised by shifting of the air, a presence who invisibly shadowed my own. So watching me and had been for several months of slingshots, from the walls, amid the crows of peep animals that thronged the man London or out among the river cru even amused eyes on me in the print at Salisbury Court, though that impossible and could only have been imagination.

It was the twenty-third day of July, was hurrying to deliver my new book before he left London for the rest of merchant ship from Portugal had

## CHAPTER I

THE year 1866 was signalled by a remarkable incident, a mysterious and puzzling phenomenon, which doubtless no one has yet forgotten. Not to mention rumours which agitated the maritime population and excited the public mind, even in the interior of continents, seafaring men were particularly excited. Merchants, common sailors, captains of vessels, skippers, both of Europe and America, naval officers of all countries, and the Governments of several States on the two continents, were deeply interested in the matter.

For some time past vessels had been met by "an enormous thing," a long object, spindle-shaped, occasionally phosphorescent, and infinitely larger





[ ALL THE DEETS ]

## Inside TechLife

GET THE LOWDOWN ON TECHLIFE'S EDITORIAL POLICIES, TEST PRACTICES, HOW TO READ THE BENCHMARK RESULTS AND MORE.

TECHLIFE IS AUSTRALIA'S youngest technology mainstream magazine, having been in print since 2012, when we launched as a redesigned and modernised version of *Australian PC User*. The latter was first printed in 1990, and *TechLife*'s current editor has been working for the mag (in both its incarnations) for over a decade. We take that 25-year heritage seriously and strive to be both ethical and transparent in our coverage of technology and any other topics we broach.

Like our sister magazine, *APC*, we have two main goals here at *TechLife*: to track down the best of modern tech and to help our readers get the most from it. We're also an open church in terms of platforms. We know most people aren't wed to a single brand's products and use a variety of devices in their lives. And like you, *TechLife*'s journalists want to know what's good in tech — no matter what platform it resides on.

### UNBIASED REVIEWS

Championing technology doesn't mean we're unrelenting positive, however, and our other aim at *TechLife* is to be as objective as possible in our coverage. That means identifying the best products from multiple perspectives — the best performance, best value and best

features and, ideally, the products that offer the best mix of these three aspects.

As a matter of policy, reviews published in *TechLife* are not shared with product-providers prior to print. We will contact vendors under certain conditions; if we have a problem testing a product that seems to indicate it may be faulty, or to invite a vendor to clarify how a particular feature works. If a *TechLife* reviewer has any potential conflicts of interest involving a brand, the review will always be assigned to another writer.

### LABS TESTING

In order to make our reviews and other stories as unbiased as possible, *TechLife* strives to conduct rigorous, objective and scientific tests and benchmarks where possible. We use a variety of tools and programs to achieve this, including many freely available benchmark suites for assessing things like general system performance, gaming, media encoding and battery life.

In most cases, for the benchmark results published in *TechLife*, you can assume that higher is better. There are certain tests that deviate from this rule and where the opposite is true; in those cases, we've flagged the results with a note explaining as such.



# The news in numbers

THE KEY FIGURES BEHIND THE LATEST ISSUES AND TRENDS  
IN TECHNOLOGY.

[ JOEL BURGESS ]



18/11/2015

**THE DATE FREELANCE HACKING BECAME A SIX-FIGURE INCOME JOB.**

Since the exposure of Hacking Team in July — a private company dabbling in the buying and selling of undiscovered device hacks to governments and corporations — other players in this space have become much more blasé about the whole operation. In November, ‘zero-day’ exploit merchant Zerodium paid a US\$1-million bounty for a new remote, full iOS jailbreak hack, which the company will reportedly on-sell to its subscriber base for a US\$500,000 per annum subscription fee. Zerodium subsequently posted a full shopping list of all the exploits it’s willing to pay for, alongside each of the particular operating systems.

78

THE NUMBER OF ISIS-RELATED CHANNELS REMOVED BY MESSAGING-APP TELEGRAM.

Although secure-messaging app Telegram has been under fire for some time over its reported use by known ISIS militants, since the tragic Paris terrorist attacks in November, a number of US politicians (including Hillary Clinton) have used the events to further an anti-encryption campaign, which seems aimed squarely at these encrypted messaging apps. Despite evidence surfacing that suspected Paris-siege strategist Abdelhamid Abaaoud was communicating via regular SMS, Telegram has subsequently blocked 78 public forums with links or content associated with ISIS.

[ WWW.TECHLIFE.NET ]

2.5  
MILLION

HOTSPOT  
THE NEWS IN NUMBERS

THE NUMBER OF AUSSIE NETFLIX SUBSCRIBERS.

The Australian Communications and Media Authority has released a report that pegs the number of Australians subscribing to streaming services at 3.2 million, or 17% of the population. The 1,505 adults that were surveyed for the sample also revealed that approximately 2.5 million preferred Netflix as their service of choice and that 58% of this market were aged between 18 and 34. Globally, Netflix's subscriber base was reported to be 62.3 million in April, with around 40 million of those users residing in the US.



5 MINUTES

THE TIME HUAWEI CLAIMS ITS NEW QUICK-CHARGE TECHNOLOGY TAKES TO HALF-FILL A SMARTPHONE BATTERY.

Chinese smartphone maker Huawei recently demonstrated a new prototype battery from its Watt Labs which can charge a 3,000mAh battery to 48% in about the time it takes to boot up an older PC. In a video posted to the popular Chinese video-hosting site Tencent, the company stated that the five-minute fast charge could be repeated many times during a battery's lifetime, but that the technology still won't be available in consumer devices for some time.

**\$15 BILLION**

## THE BLOWOUT IN COSTS ASSOCIATED WITH NEW NBN ROLLOUT PLAN.

In August, the quote for the Coalition Government's new Multi-Technology Mix (MTM) NBN plan was revealed as ultimately costing between \$5 and \$15 billion more than the Labor Government's previous FTTN model. At the time, then Communications Minister Malcolm Turnbull blamed the former NBN administration, accusing it of inaccurate accounting. Former NBN CEO Mike Quigley recently struck back however, stating that the added expense was due to the complexities of moving to the MTM plan. At the NBN's quarterly briefing in November, CEO Bill Morrow further clarified, explaining that an \$8 billion spike in peak funding costs was "mostly" to do with the two new NBN technologies.



## HOTSPOT



On its own, the iPad Pro is basically a gigantic iPad. Add in the Pencil stylus and the Smart Keyboard and it becomes a servicable 2-in-1 with some unique capabilities.

[ SERIOUS STUFF ]

## One for the pros

APPLE'S LATEST iPad IS A BEHEMOTH MADE FOR THE BUSINESS CROWD. BUT CAN IT STAND UP AGAINST MICROSOFT'S SURFACE LINE?

[ DAN GARDINER ]

### Apple iPad Pro

**BIGGER, BOLDER, BETTER FOR BUSINESS?**

IT'S HARD TO overstate how big the iPad Pro is. While its screen size of 12.9 inches might not sound like a huge increase over the 9.7-inches of the iPad Air 2, in the flesh, the Pro proves monstrous, with a footprint that's only a little smaller than a 13-inch MacBook Air. While it's not overly heavy and is naturally quite thin, its large footprint means that this is a tablet that needs to be held firmly with two hands, plonked on a desk or, at the very least, nestled in the crook of an arm.

That 'Pro' in the name should make it clear where Apple's pitching this one: at the creatives and business users who've slowly been warming up to tablets over the last few years.

While Apple CEO Tim Cook may have repeatedly poo-pooed the very concept of 2-in-1 tablet/laptop hybrids, the Cupertino company's new iPad Pro sails pretty close to the Surface Pro design, what with its optional keyboard cover and stylus.

The Pro certainly has the specs to live up to that promise on the hardware side of things. That 12.9-inch display has a higher 2,732 x 2,048-pixel resolution and is powered by a new dual-core Apple A9X processor — a higher-end version of what's in the iPhone 6S — paired with 4GB of memory

(twice any other iOS device) and a 10,000mAh battery that does deliver Apple's promised 10-hour battery life. This is a blazing-fast tablet — the quickest ARM-based device we've ever seen — that's about 50% faster than the iPad Air 2 across the board. As with all the other iPads, there's optional 4G data support too — something you don't get with Microsoft's competing Surface line in Australia.

### SINGING IN THE KEY OF BUSINESS

On its own, the iPad Pro arguably isn't much more than a bloody big iPad. It's largely through accessories that it's 'pro' pitch starts to solidify.

The Pencil is the first part of that equation, a comfortably sized and weighted Bluetooth stylus that offers about 12 hours of use per 20-minute recharge — something that requires you to slightly clunkily plug it into the iPad Pro's Lightning port.

Apple calling this stylus the Pencil isn't just about giving it a hipster name either. Like a real pencil, the angle at which you use it controls the stroke width, so in supported apps, it makes for an excellent sketching and painting tool that's quite intuitive and organic in use.

3½


#### APPLE IPAD PRO

From \$1,249 (32GB, Wi-Fi); Apple Pencil, \$165; Smart Keyboard for iPad Pro, \$269

#### CRITICAL SPECS

iOS 9.3, 12.9-inch IPS LCD touchscreen (at 2,732 x 2,048 pixels), dual-core XXGHz Apple A9X CPU, 4GB RAM, 32/64/128GB storage, optional 4G data support, 713g



The image shows an iPad Pro in its closed position, with the Smart Keyboard attached. The Apple Pencil is lying next to it. A red text box is overlaid on the top left of the iPad. The text inside the box is white and reads: 'THE OTHER HALF OF THAT PRODUCTIVITY FORMULA IS THE SMART KEYBOARD, EFFECTIVELY ONE OF APPLE'S SMART COVERS WITH A KEYBOARD ATTACHED TO THE END. THIS CAN INITIALLY BE A TAD CLUNKY TO UNFURL AND ATTACH, BUT ONCE YOU GET USED TO HOW IT WORKS, IT'S FAIRLY SMOOTH.'

THE OTHER HALF OF THAT PRODUCTIVITY FORMULA IS THE SMART KEYBOARD, EFFECTIVELY ONE OF APPLE'S SMART COVERS WITH A KEYBOARD ATTACHED TO THE END. THIS CAN INITIALLY BE A TAD CLUNKY TO UNFURL AND ATTACH, BUT ONCE YOU GET USED TO HOW IT WORKS, IT'S FAIRLY SMOOTH.

The other half of that productivity formula is the Smart Keyboard, effectively one of Apple's smart covers with a keyboard attached to the end. This can initially be a tad clunky to unfurl and attach, but once you get used to how it works, it's fairly smooth (though never quite seamless). The keyboard has a sealed design that should make it more resistant to spills, and keys have a slightly rough texture, like synthetic fabric. Like many other iOS hardware keyboards, this one packs the traditional Mac system keys (Control, Option and Command) which means you can use many OS X keyboard shortcuts, including cutting and pasting, Command-Tabbing to switch between apps, or using the arrow keys for quicker navigation in text.

There's some funky tech inside the keyboard too — it doesn't use Bluetooth, instead connecting physically to the iPad Pro and drawing power from the latter.

On the go, it works better on the lap than the Surface Pro, too, thanks to a flatter base design that keeps it more stable. It's not as good as a real laptop, mind you, but you can get by.

There's not much to complain about with the Smart Keyboard, although we do feel that its closeness to the screen isn't ideal. Every now

and again during vigorous typing sessions, we found one of our ring fingers would accidentally tap the screen, moving the cursor off to some random point and needing to be repositioned again. It's also a little heavy, adding 337g to the iPad's 713g and taking the whole package to just over a kilo.

#### WORKING WITH IOS & MOBILE APPS

The extra physical screen size has allowed Apple to put in an almost full-sized software keyboard, complete with a row of number keys and a predictive-text line. In updated apps, you also get to see more on screen, which means more characters per line and more rows of text when you're editing documents, more cells when you're playing with spreadsheets and more room for tools and brushes in image-editing apps.

Having that kind of expanded view does undeniably make the Pro a better device for getting stuff done, and it makes iOS 9's split-screen multitasking mode a lot more usable. Many of iOS's best productivity apps have been updated to take advantage of the Pro's new dimensions and some design-oriented ones have even added Pencil-specific support.

Still, iOS isn't as fundamentally productivity-friendly as a traditional desktop OS, and it does require some amount of compromise and adjustment (and occasionally just accepting that you can't do certain tasks on iOS) to use the iPad Pro in place of a MacBook or a Windows laptop.

Beyond work applications, there's actually a lot to like about the Pro as an entertainment device. Gaming — and, in particular, playing intense 3D titles like racing games — is a spectacular experience on the device, and better speakers (of which there are four) make it great as a portable movie player, too.

#### FIRST-BORN PROBLEMS

Despite everything the iPad Pro does right, there are still elements that have been overlooked or just don't live up to Apple's much-vaunted design ethos.

A key one of those is the lack of built-in handwriting support. OS X has had some form of handwriting transcription for over a decade, so it's perplexing to see it missing here. Yes, you can cludge it in via third-party keyboards and cloud-connected apps that will upload your scribbles and translate them to typed text (such as Microsoft's OneNote), but not having handwriting as a universally accessible feature is a serious shortcoming. It's something the Surface line has done well since version one, and limits the Pro's capabilities when it comes to work flexibility.

There's also a smattering of minor design choices that can be irritating. There's nowhere to dock the Pencil when it's not in use and the Smart Keyboard only lets the iPad sit at one angle, which may not suit taller users. And iOS feels a bit Fisher Price in some areas: despite all the extra real-estate, you still only get 20 icons per home screen (with a lot of empty space).

Then there's the price. While the base iPad Pro itself is reasonably affordable — the 32GB Wi-Fi model costs \$1,249 and the top-end 128GB/4G option is \$1,699 — the price of accessories is another matter. To get the full 2-in-1 solution, you'll need to pay \$165 for the Pencil and another \$269 for the Smart Keyboard.

#### THE BEST OPTION FOR PRODUCTIVITY?

While there's certainly potential here, this is a device that's most successful within one specific niche — graphic designers who use pen-driven apps. Some of the other elements feel like very un-Apple-like compromises. For now, if you want a tablet for more general productivity, the Surface Pro 4 is the more flexible choice. ■





[ MICROSOFT, ROLL OUT! ]

# Rolling out a new Surface

MICROSOFT'S NEW 2-IN-1 IS MORE LAPTOP-TABLET THAN TABLET-LAPTOP.  
IS THAT A GOOD THING?

[ DAN GARDINER ]

## Microsoft Surface Book

EXTENDING THE SURFACE FAMILY  
IN A NEW DIRECTION.

SINCE THE FIRST Surface launched a little over three years ago, Microsoft has aggressively pushed the 2-in-1 concept — tablets that can replace your laptop thanks to an (optional) keyboard cover that lets you have your cake and eat it too. The new Surface Book comes at things the other way and the fact that Microsoft calls this “the ultimate laptop” on its website is a fairly telling sign of where it’s aiming — it’s very much a notebook first and a tablet second. And with a tough and slick-looking exterior that’s hewn from the same matte-finish magnesium-alloy as the Surface tablet line, an absolutely gorgeous 13.5-inch, super high-res (3,000 x 2,000-pixel) display, the new multi-nib Surface Pen, an optional Nvidia GPU for when the going gets tough and up to 12 hours battery life, it’s certainly kitted out with a lot of neat, cutting-edge tech. So is this a natural extension of the Surface 2-in-1 concept, or a wrong turn into a dodgy cul-de-sac?

### PRICED FOR PROS

Starting from \$2,299 in Australia — around \$1,000 more than the cheapest Surface Pro 4 — and reaching all the way to \$4,199 for the top-end Intel 6th-gen Core i7/512GB SSD unit we tested, the Surface Book is decidedly priced for the pro and business market. What’s more, models with that dedicated Nvidia GPU start at \$2,949, so if you want the extra horsepower — which Microsoft is pitching more at content-creation (videos, images and so on) than gaming, that more-affordable base model isn’t going to be an option.

Still, the design is fairly classy all round, with that accordion-style hinge the most obvious standout. It’s undeniably one of the most elegant 2-in-1 docking

mechanisms we’ve seen, seamlessly mating the display with the keyboard and locking it into place securely via a special ‘muscle wire’ — if you didn’t know the screen was detachable, you’d think this was just a premium laptop with a thickish display. A magnetic edge on the lip holds the screen and keyboard base securely shut, but as pics clearly demonstrate, that rounded rear hinge does mean there’s always a gap between the keyboard and screen (which becomes increasingly wide the further back it goes). Moreover, that premium build quality extends to basically every other area of the Surface Book. That means first-class inputs, with a large and responsive glass trackpad and a near-perfect chiclet keyboard — the latter feels, to us, even a bit more comfortable to type on than a MacBook, which is the laptop keyboard benchmark.

That 13.5-inch IPS touchscreen uses that productivity-friendly 3:2 aspect ratio and is factory calibrated for 100% RGB coverage, meaning it’s great for colour-accurate design work. Like the Pro 4, the Surface Pen snaps securely onto the left side of the display here, and in use, offers the same advantages of direct content-manipulation.

And the Book’s screen can be undocked, rotated 180° and snapped back on, theoretically giving you a high-powered tablet with 12 hours battery — although it’s a heavy one, which needs to be used on a lap or desk, and the display doesn’t sit flat due to the Book’s curved hinge design.

### HIDDEN HORSEPOWER

The keyboard’s chassis isn’t just dead space either — there’s an additional battery (adding another nine hours to the tablet’s claimed three hours) as well as that Nvidia GeForce GPU. Microsoft doesn’t specify which GPU this is, but based on our benchmark results, it seems to be a tweaked GTX 840M — not a chip we’d outright recommend for

The Surface Book has two distinct batteries: one behind the screen, allowing the latter to detach and act like a tablet, and another that’s three-times as big hidden away underneath the keyboard.



### MICROSOFT SURFACE BOOK

From \$2,299;  
\$4,199 as tested  
[www.microsoftstore.com](http://www.microsoftstore.com)

### CRITICAL SPECS

Windows 10 Pro (64-bit),  
13.5-inch IPS LCD  
touchscreen @ 3,000 x  
2,000-pixels, dual-core  
2.6-3.4GHz Intel Core  
i7-6600U CPU, 16GB RAM,  
Intel HD Graphics 520 &  
Nvidia GeForce GPUs, 512GB  
SSD, Surface Pen stylus  
with interchangeable tips,  
1.59kg (tablet-only 732g)





gaming, but something that will let you scrape by at about 720p (or the nearest 3:2 aspect ratio resolution you can find) in many games. To be fair, the Nvidia graphics chip isn't really here for gaming and Microsoft is quite clear on the matter. It's intended to accelerate media-creation tasks in programs like Adobe's Creative Suite.

#### GIVE AND TAKE

But while the Book makes a fairly impressive laptop, as a tablet, it's something of a mixed experience. While it's incredibly (and impressively) lightweight considering its 13.5-inch footprint — just 732g, even lighter than the Pro 4 — it's not something you can really detach and take with you. Part of that has to do with battery life — Microsoft admits it's only good for three hours (we managed to get around half that in our demanding battery benchmark) and the other has to do with inputs. There's no USB port — they're all on the keyboard — so you can't easily plug in extra storage or peripherals. That means if you want the kind of flexibility that a Surface Pro offers, you'll need to lug the whole 1.59kg package around with you.

Detaching the tablet from the keyboard isn't quite as seamless as we'd like either, something that's largely caused by having dual GPUs. Before you can pull off the screen, you first need to press a button on the keyboard (or click an icon in the system tray) which releases the muscle wire. If you have a GPU accelerated program running, you'll get a prompt saying you need to close that app before the tablet will detach — and there's no way around this. Having the system components all behind the screen makes the Book top-heavy, too. That means if you're using it in notebook form on your lap with the screen at an obtuse angle, it can have a tendency to tip backwards.

#### VARIATIONS ON A THEME

Microsoft's really pitching the Book and the Pro 4 to different user needs — and choosing between them is really about picking whether you want a laptop-leaning-tablet or a tablet-leaning-laptop. The Surface Book is certainly a better laptop than the Pro — you can (mostly) use it on your lap, as the Pro's kickstand makes attempting this fiddly. And the Book certainly has the slickest docking mechanism in a 2-in-1 we've encountered.

When using the Book, we did find ourselves wishing that Microsoft would just make a Surface laptop without the tablet parts — but the company has somewhat painted itself into a corner by aggressively marketing the 2-in-1 concept. To a degree, Microsoft has actually undermined the Book with many of the improvements it's included in the Surface Pro 4. The latter's chiclet keyboard, glass trackpad and improved stylus minimise or extinguish a lot of the Book's key advantages.

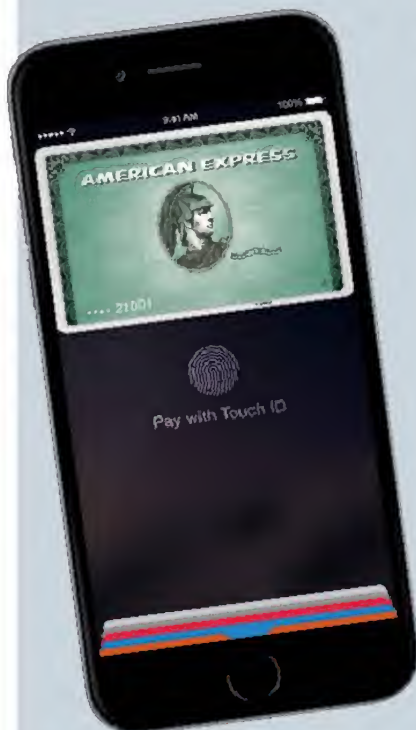
#### SHOWN UP BY LITTLE BROTHER

None of that makes the Surface Book a bad product — just one that's a much harder sell. Ironically, it somewhat further vindicates the original Surface design too, which has improved in leaps and bounds with each new generation.

For the few professional designers and business users who think they can take advantage of the Book's unique features, this is undoubtedly a great product. But it's also quite a niche one, and if you want tablet features, it's strongly worth considering whether a Surface Pro 4 might suit you better. For most users, the latter would be our choice over the Surface Book — or the iPad Pro, for that matter. ■







[ BLIP ]

**APPLE PAY HAS FINALLY ARRIVED FOR AUSTRALIANS**

IF YOU HAVE AN AMEX CARD.

It's been a long time coming, but Apple Pay has finally made it to Australia. American Express card holders now possess the ability to pay for stuff using an iPhone or Apple Watch. Simply enter your AMEX details into the Wallet app on your iPhone, which will then ask your bank for verification before allowing you to make purchases. [ SL ]

[ POPE SAYS NOPE ]

**FORK UP, PHONE DOWN**

POPE SAYS YOU SHOULDN'T USE YOUR PHONE AT THE DINNER TABLE.

Put your phone down, turn off the TV and talk to the people you're eating with — that's the advice coming straight from Pope Francis. "When children at the table are attached to the computer or the phone and don't listen to each other, this is not a family, this is a pensioner," he's quoted as saying during a sermon at St. Peter's Square, according to the Catholic News Agency. [ PT ]

[ BLIP ]

**FUTURE INTERNET TO BE TRANSMITTED BY LIGHT**

LI-FI COULD BE THE FUTURE OF DATA TRANSMISSION.

Could the Internet of the future transmit through light sources? Several university researchers and high-tech start-ups are currently working on 'visible light communication' technology that would allow an LED light source to transmit data at 100 times the speed of Wi-Fi. It's been estimated that the Li-Fi market will be worth approximately \$8.5 billion by the year 2020. [ SL ]



[ BUT WHY'S RUM GONE? ]

## Village Roadshow's war on piracy kicks off

WANTS TO GET THIS ANTI-PIRACY SHOW ON THE ROAD.

FED UP WITH internet piracy, the Australian media company Village Roadshow has announced its intention to take advantage of the Australian Government's new anti-piracy laws by submitting an application to the Federal Court.

The legislation, dubbed Copyright Amendment (Online Infringement) Bill 2015, allows rights holders to apply for an injunction against overseas websites, like The Pirate Bay, that facilitate copyright infringement in Australia.

Piracy websites that are successfully hit with an injunction will be replaced by a landing page notifying visitors that the site has been blocked by the court, though one has to imagine how effective this approach would be when sites like The Pirate Bay and Kickass Torrents change domains and hosting companies on what seems like a weekly basis.

Though the legislation was passed back in June, Village Roadshow will be the first rights holder to submit an application under the laws, which is a small step towards the promise co-founder Graham Burke made back in August, in which he said "we will sue people". [ SL ]

[ WAR ON ISLAMIC STATE ]

## Anonymous vows to take down ISIL

BUT IS THE HACKER GROUP DOING MORE HARM THAN GOOD?

ACTIONS BY HACKING group Anonymous has already lead to 5,500 pro-ISIL Twitter accounts being shut down (it involved flooding said accounts with videos of Rick Astley's *Never Gonna Give You Up*). Not a bad first step, and it comes after the 12-year-old group said it "will launch the biggest ever operation" against ISIL, according to transcripts of a video on YouTube. However, security agencies say that they rely on ISIL members being active and having active social media accounts so that they can track would-be terrorists,

monitoring them rather than shutting them down. This is a tactic employed by GhostSec, who relied on Twitter's open platform to track extremists. With those accounts now deactivated, ISIL members have taken to encrypted messaging sites such as Telegram. GhostSec's site says it is dedicated to eliminating "the online presence of Islamic extremist groups such as Islamic State [and others] in an effort to stymie their recruitment and limit their ability to organise international terrorist efforts". [ PT ]





[ HANDS OFF ]

### FALLOUT 4 BATS OFF PORN SITE PORNHUB'S TRAFFIC DIPS THE SAME DAY RPG LAUNCHES.

Traffic on infamous adult entertainment website Pornhub dramatically dropped the same day that Bethesda released Fallout 4 (reviewed on page 34). According to the site's metrics, its average traffic plummeted by nearly 10% at the exact same time that gamers had finished installing Fallout 4 on the day it launched. "We can't say we blame anyone for swapping Pornhub time for some Pip-Boy surfing instead," Corey Price, a Pornhub VP, told GamesBeat. [ PT ]

[ BLIP ]

### ADOBE WANTS YOU TO STOP USING FLASH

#### ENCOURAGES USERS TO MOVE ON TO GREENER PASTURES.

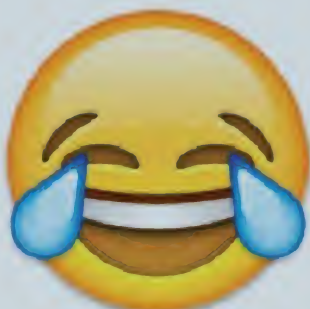
Though it's been slowly obsolescence for the better part of a decade, Adobe is finally ready to let go of Flash, advising users to "build with new web standards", such as the open standard HTML5. Adobe's first step in doing so involves the retiring of the 'Flash' name, renaming the application Animate CC, positioning it instead as a general animation tool. [ SL ]

[ LOL ]

### #2015 #WTF?

#### OXFORD DICTIONARY SAYS WORD OF THE YEAR IS AN EMOJI.

No, the word of the year is not 'emoji' but an emoji. Specifically the one you can see below, the 'tears of joy' emoji. According to the bods at Oxford, there were other contenders such as 'lumbersexual' and 'ad blocker', but the pictograph took out the award as it "best reflected the ethos, mood and preoccupations of 2015". [ PT ]



[ UN-PI-LIEVABLE ]

## Cheapest Raspberry Pi model released will cost just US\$5

### PI ZERO MINI-PC IS IDEAL FOR STREAMING, CODING AND MUCH MORE.

THE RASPBERRY PI Zero is the latest model in the DIY computer range, and it's the smallest one yet. For approximately AU\$7, the motherboard packs a Broadcom BCM2835 CPU running at 1GHz, backed with 512MB of LPDDR2 SDRAM, complete with a microSD slot, mini-HDMI port (allowing for 1080p video output at 60fps) and micro-USB sockets, though you still have to provide your own case. Because it's so new, you may have to wait a little while for cases to become available, and it's

unlikely it'll fit into existing cases — the unit is half the size of the Model A+. Raspberry Pi was heralded as being ideal for schools to teach kids how to code using inexpensive hardware, though the wider community has found out that the low-power devices are very robust at streaming media. Grab an operating system (there are lots available), a microSD card and a USB Wi-Fi dongle, and you can stream media across your network for well under \$100. [ PT ]

[ KEEPING SECURITY TIGHT ]

## Tech giants say weakened encryption would "help the bad guys"

### IT FIRMS RESPOND IN THE WAKE OF THE PARIS ATTACKS TO CALLS FROM GOVERNMENTS TO ALLOW BACK DOORS TO ENCRYPTED DATA.

MORE THAN 60 tech companies, including Facebook, Samsung, Microsoft, Apple and Google, have joined together to reject calls from regulators to weaken encryption tools used in industries such as banking and transport. Governments from around the world have debated about the need for 'back door' access to encrypted data in the aftermath of the terrorist attacks in Paris in November this year, so that security services could monitor communications. Creating weakened encryption would be "exploited by the bad guys", says the Information Technology Industry Council's chief executive, Dean Garfield. "We deeply appreciate law enforcement's and the national security community's work to protect us, but weakening encryption or creating back doors to encrypted devices and data for use by the good guys would actually create vulnerabilities to be exploited by the bad guys, which would almost certainly cause serious physical and financial harm across our society and our economy. Weakening security with the aim of advancing security simply does not make sense." [ PT ]





#### HUAWEI WATCH

From \$549  
[www.huawei.com/au](http://www.huawei.com/au)

**CRITICAL SPECS**  
Android Wear 5.1.1, 1.4-inch AMOLED screen @ 400 x 400-pixels, 1.2GHz Qualcomm Snapdragon 400 CPU, 512MB RAM, 4GB storage, 300mAh battery, 61g-131g depending on strap.

[ SMART ON THE INSIDE ]

## The Android you'll want to wear

HUAWEI'S FIRST ANDROID SMARTWATCH COULD PASS FOR A REGULAR 'DUMB' ONE AND IT BEATS MOST OF THE COMPETITION PRECISELY FOR THIS REASON.

[ SPENCER HART ]

WITH A FULLY circular face, expensive materials and battery life that's actually half decent, there's a lot to like about the Huawei Watch, but it's by no means perfect.

With prices starting at \$549, it's one of the most expensive Android Wear watches to date, though it's soon to be overtaken by the luxury Tag Heuer Android Wear device. Is the Huawei Watch worth the extra cash, or is your money better spent on a cheaper Android Wear device such as the uncannily similar looking Motorola Moto 360?

Huawei's device features an AMOLED display measuring 1.4 inches in diameter, and really impresses with its 400 x 400 resolution. That gives it a pixel density of 286ppi, which is on par with the Apple Watch's retina display.

The extra pixels really stand out when putting the Huawei Watch next to other circular Android Wear watches (including the new Moto 360 and LG G Watch Urbane). It's visibly sharper, and clearer as a result.

The completely circular screen also has the advantage of being able to use white watch faces without ruining the design, as opposed to the Moto 360 with its flat tyre.

The Huawei Watch only comes in one size, measuring 42mm in diameter and 11.3mm thick. That's the same diameter as the smaller offering from Motorola, but the 360 is actually 0.1mm thicker. Strangely though, on the wrist you'd swear the Moto is thinner.

Huawei has equipped the Watch with a 300mAh battery, which is actually quite small for such a thick device. It's good for between one-and-a-half and two days of use, and charging the battery to full takes around an hour, which is quick enough that you can just plug it in while you're in the shower.

We weren't sure about Android Wear when it first released, it was clunky and didn't really do much. But thanks to frequent updates from Google, the OS is really coming into its own.

The Huawei Watch runs the most recent version, 5.1.1, which brings with it some important features such as iPhone compatibility, Wi-Fi, watch-to-watch messaging and gesture support.

The Android Wear interface can involve a bit too much swiping and flicking, but if you find the Apple Watch too fiddly, it's an improvement over that.

The Huawei Watch comes packing a 1.2GHz Qualcomm Snapdragon 400 processor and 512MB of RAM. That might not sound like much, but it's enough to run Google's low-powered operating system smoothly.

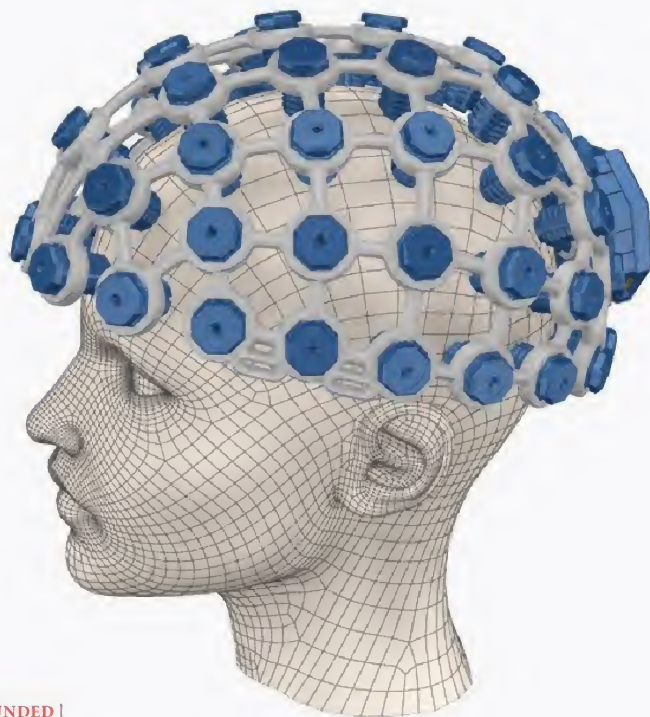
There's still a perceptible lag when opening apps — around two seconds, which is slightly annoying — but it's manageable, and only apparent because we're used to the latest smartphones doing everything instantly.

The device has 4GB of storage on board for music and apps, and its internal specifications and performance are on par with the latest watches from Motorola, ASUS and Sony. There really is very little to differentiate between them.

The Huawei Watch is one of the best smartwatches on the market, but then again, it should be because it's also one of the most expensive.

If you're fully sold on the idea of smartwatches and want the best Android Wear option around, Huawei's device is probably your best bet. If you're not so sure, and want to test the waters first, there are cheaper options available with the same functionality and, in the case of the Moto 360, a remarkably similar look. ■





[ CROWDFUNDED ]

## Kickstarted!

FROM THE PRACTICAL TO THE QUIRKY TO THE DOWNRIGHT STRANGE, CROWD-FUNDING WEBSITES HAVE ALLOWED THE CREATION OF AN AMAZING RANGE OF PRODUCTS. HERE'S A SELECTION OF LATEST PROJECTS THAT PIQUED OUR INTEREST.

[ CARMEL SEALEY ]

[ BRAIN POWER ]

### OpenBCI Ganglion and Ultracortex Mark IV

www.openbci.com | US\$80,000  
Raised: US\$105,403 from 393 backers  
RRP: US\$450

OpenBCI has created a "biodata acquisition device and a 3D-printed, brain-sensing headset". For those of us who don't know what transcranial direct-current stimulation (tDCS) is, well, essentially, it's the science of studying specific parts of the brain via electric stimulation by a series of sensors to further our understanding of how the brain works. In its mission to "lower the barrier of entry to neuroscience", the team aims to make its new and improved platform more accessible to everybody and encourage the next generation of brain enthusiasts. It also aims to establish an open-source body of research so that, together, we can find out who we are.



[ SAD TROMBONE ]

### Failed Kickstarter of the Month

SOME CROWDFUNDING IDEAS WERE NEVER DESTINED TO SUCCEED.

[ MESA, BUT NO YOUSA ]

#### MESA9

www.mesa9.com | Initial goal: US\$50,000  
Raised: US\$0 from 0 backers

You know when you create an online account for something and you meticulously opt out of newsletters for "special offers and announcements" so you don't get spammed? Well, imagine a social network where you start with everybody's boxes ticked and you had to individually opt out of every single one of them once you found out they were



boring, annoying or rude. The idea behind this project was to put everyone on an "equal standing", but then goes on to say that you will "lose your standing with the community" if your posts aren't cool enough. "This is the opposite of how most social networks work" — yeah, so that should give you an indication of why it failed...

Dec  
2015

Jan  
2016



[ I'M LIKE A BIRD... ]

#### POWERUP FPV

www.poweruptoys.com | Initial goal: US\$100,000  
Raised: US\$279,359 from 1,441 backers  
RRP: Approx US\$200 (including head-mounted display)

This campaign claims to make 'magical' "un-freaking-believable". This live-streaming paper aeroplane drone comes from the same mastermind as PowerUp 3.0 — a smartphone-controlled paper aeroplane. Taking the idea one step further, aviator innovator Shai Goitein has added a live-streaming camera to the device, so you can view the flight of your aeroplane as though you were on board. The camera streams the flight to your smartphone, which you use to control the plane. You can also insert your phone into a cardboard head-mounted display and continue to pilot your plane by tilting your head slightly. The companion app also looks very neat, providing speed, altitude, battery, compass and lots of other useful figures.



Dec  
2015

[ ENLIGHTEN ME ]

#### LUXOR 2

www.plxdevices.com | Initial goal: US\$25,000  
Raised: US\$259,655 from 2,488 backers  
RRP: US\$149

So you're walking through the dark and scary forest and your torch is illuminating a one-metre sphere around you. You hear something rustling somewhere ahead but your torch can't pick it out. Sounds like a recipe for brown trousers to me. Luckily, Luxor 2 is here — an ingenious invention from PLX Devices. This is the improved model of the world's first changeable focus torch, the Luxor. This second instalment provides four different kinds of lights — flood, wide beam, narrow beam and lantern to cater to all your portable lighting needs. As well as being waterproof, it's easy to charge and includes "auto responsive focus", so the torch itself knows where it is being pointed and adjusts accordingly.





4

#### SYNOLOGY RT1900AC

\$229

[www.synology.com](http://www.synology.com)

#### TECHNICAL SPECS

2.4GHz 802.11b/g/n Wi-Fi (up to 600Mbps), 5GHz 802.11n/ac Wi-Fi (up to 1300Mbps), 4 x Gigabit Ethernet, USB 3.0 port, SD card slot, three external antennas, hardware power button.

# Synology RT1900ac

**A NAS COMPANY RELEASES ITS FIRST ROUTER... AND SURPRISES US WITH ITS FLEXIBILITY AND SOFTWARE FEATURES.**

WHILE MANY UNCONVENTIONAL brands have tried to gain a toe-hold in the broadband router market over the last half decade, only one or two have really managed to stick it out. We're hoping Synology is another name we can add to the list. Better known for its network-attached storage boxes, Synology is looking to bring over the same software smarts that have made its NAS devices some of APC's favourites.

Specs-wise, the new RT1900ac is respectable but nothing particularly cutting edge. It's got dual-band 2.4/5GHz Wi-Fi (at 600Mbps and 1,300Mbps, respectively) and is powered by a mid-range dual-core 1GHz Broadcom BCM58622 processor with 256MB of memory.

However, the router stands out not on specs, but on smarts. Running an OS called Synology Router Manager (or SRM), configuring the RT1900ac is done the same way as most others — go to the device's IP address (such as 192.168.1.1) in your browser and log in with your admin username and password. Rather than simple text-based menus and drop-down boxes, SRM's interface apes a standalone OS, giving you a virtual desktop with app icons and programs that launch inside their own

windows, which you can drag around, resize and minimise or maximise.

Moreover, SRM is overflowing with features and options. Its bandwidth management settings are some of the most advanced we've seen, allowing you to monitor usage in real time, based on either device or application, or restrict a single device's upload and download speed with hard KB/s limits. There are in-depth parental controls and you can easily set schedules to turn off access for specific devices at certain times of day — great if you have kids and don't want them up all night on the net. You can configure lots of little things to levels of detail not usually seen, like turning the status LEDs off at night-time, and there's a comprehensive built-in manual that reveals what everything does in plain English. Synology even offers well-made admin mobile apps for iOS and Android.

Beyond the built-in tools, you can add more functions by installing modules downloaded from Synology. Adding Download Station,

for example, lets you plug in a USB storage device and download things directly with the router, with lots of options to get it set up.

The only worry we have with the RT1900ac is that its performance was mixed. While it was up with the best at close range (managing read and write speeds of 57.7 and 68.3MB/s, respectively), at medium to long range, it dropped to more sedate speeds (30MB/s and 20MB/s), which puts it below average and about 10–15MB/s

behind the best in these areas.

What's not in dispute is that the RT1900ac offers features and a level of depth you won't find elsewhere. Its SRM interface often makes managing and monitoring your network easier than on basically any other router we've tested. You may need to do a little learning to make use of some of those features, but it does a good job of explaining what all the bells and whistles do. If you can deal with just average performance, this is an amazing device from a features standpoint, and one that's quite affordable, too. ■

**SPECS-WISE, THE NEW RT1900AC IS RESPECTABLE BUT NOTHING PARTICULARLY CUTTING EDGE.**





[ IF&amp;%\$#@\* LOVE SCIENCE! ]

## Pop science

THE LATEST DISCOVERIES, INVENTIONS AND SCIENCE NEWS  
THAT'S HELPING SHAPE THE WORLD OF TOMORROW.

[ JOEL BURGESS ]

### Bot wants to map the ocean floor

FORMER MIT STUDENT DEVELOPS AUTONOMOUS AQUATIC MAPPING ROBOT.

A mechanical engineer from MIT has landed a place in the finals of a [Google-backed] start-up accelerator program called Mass Challenge. His entry: a pumpkin-sized submarine that could be used to map the oceans. EVE — or Ellipsoidal Vehicle for Exploration — is an autonomous aquatic

robot that was designed to chart the 95% of the ocean floor that's currently unknown to science. Though there are a few remotely operated submarine drones already available, EVE is the first to be able to operate autonomously.

### Earth now 1°C warmer than pre-1800s.

WE'RE HALFWAY TO WHAT SCIENTISTS BELIEVE IS THE POINT OF NO RETURN ON CLIMATE CHANGE.

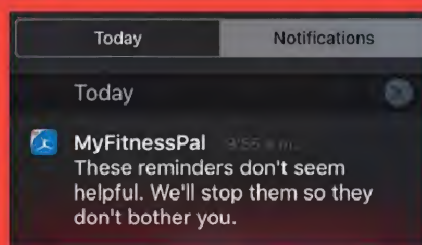
In November, scientists recorded that the average global temperature had now officially warmed to more than 1°C since pre-industrial times, surpassing the halfway mark for what scientists predict to be the tipping point for dramatic weather repercussions caused by CO2 emissions. Though the shifting of the global weather cycle from El Niño to La Niña at some point in 2016 will likely bring yearly temperatures back down below that 1°C average, in years to come, that temperature increase will become commonplace.



### TWITTER'S BIG-DATA CAN PREDICT DISEASE OUTBREAKS

HASHTAGS ARE FOR MORE THAN JUST NEWS.

In 2011, the University of Bristol set up an algorithm to analyse over 50 million tweets for keywords that might indicate the onset or presence of the flu in its users. It matched this with collected data about the number of GP consultations for flu diagnoses, in an attempt to teach the systems how to predict an epidemic. Since this development, many similar ventures have created predictive technologies based on Twitter, for everything from an Ebola outbreak to the CSIRO's We Feel tool, that maps collective emotion through the social network.



### DIET APPS DON'T WORK

SMARTPHONE APPS DON'T SOLVE THE WEIGHT PROBLEM, ACCORDING TO A NEW STUDY.

According to a paper published in the research journal Obesity, Android-based diet apps aren't any better than a few pamphlets at helping people shed weight in the long-term. The study followed three groups totalling 103 participants that were given either a smartphone app, a diet coach and the smartphone app, or just a set of pamphlets and found that app users had lost no more 'chubb' than the pamphlet group when subjects were weighed at 6, 12 and 24 months.

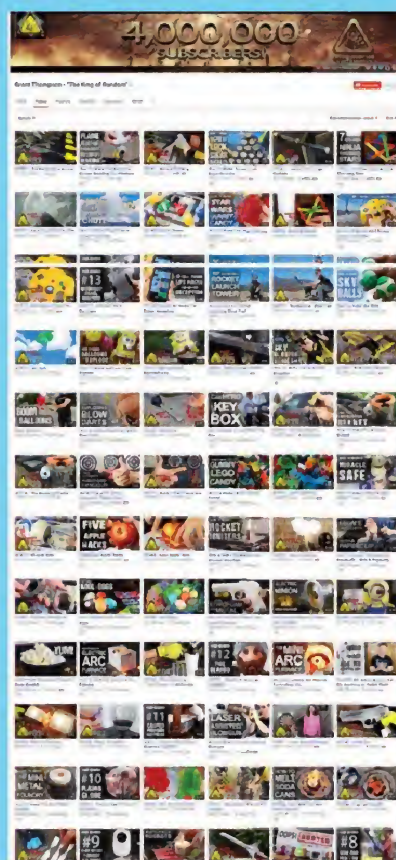
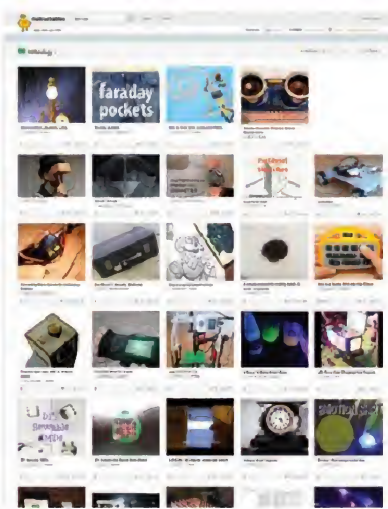


### ROBOTS GO TO UNIVERSITY

NASA'S R5 HUMANOIDS GIVEN TO UNIVERSITIES FOR EXTRA-TERRESTRIAL LOCOMOTION PROGRAMING.

Two research teams from MIT and the Northeastern University in Boston who won a robotics-competition held by the Defence Advanced Research Projects Agency have each been awarded one of NASA's latest humanoid robots, the R5. In addition to a two-year loan of the advanced R5 units, the universities will also receive a US\$250,000 funding grant to improve the robot's autonomy for future space missions. ■



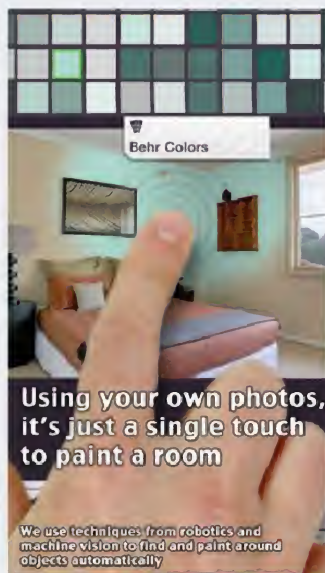


## [LINDSAY HANDMER]



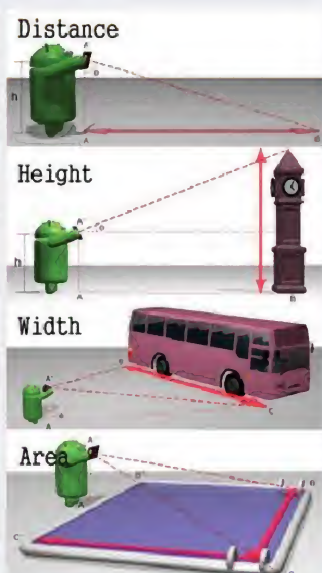
## APPS

MANY OF YOUR FAVOURITE WEBSITES (SUCH AS IFIXIT, INSTRUCTABLES AND WIKIHOW) ALSO HAVE APPS, BUT HERE IS A RANGE OF UTILITIES THAT WILL HELP YOUR DIY PROJECTS GO SMOOTHLY.



### PAINT HARMONY

Available on both Android and iOS, this app lets you try out and match new paint colours. Simply snap a picture of a room and tap to paint the walls. The app automatically figures out the edges and objects and paints around them. The basic version is free, while upgrading to Pro is only \$1.10.



### SMART MEASURE

Forget your tape measure or ruler? This handy iOS and Android app uses your smartphone camera as a rangefinder to calculate distances. It's surprisingly accurate and works from distances of a few centimetres up to kilometres. It's free and ad-supported, or \$1.99 for the pro version.



### BUBBLE LEVEL

Need to hang a picture up or level something, but don't have the right tool? This free app uses your phone's accelerometer to create a digital spirit level. Available on both Android and iOS.



### MAGICPLAN

Available on iOS or Android, this app creates an editable floor plan from pictures snapped on a smartphone. A must for home DIY, you can plan renovations, test furniture and record notes. \$2.99, free to try.

## MAKEZINE

Focused on technology, this community-based website is filled with a huge range of DIY projects. It's also about learning new skills, with resources for those getting started. Makezine also has a lot of projects and information that revolves around 3D printing and other digital fabrication methods.

## IKEA HACKERS

A multitude of unique and interesting ways to use affordable IKEA products in your projects. From art to bathroom upgrades and workshop makeovers, IKEA Hackers is a unique but very handy DIY website. Users can search existing projects, browse for ideas or submit their own hacks.

## REDDIT

Start with [www.reddit.com/r/DIY](http://www.reddit.com/r/DIY), which features almost five million users who share DIY projects, guides and more. From electronics projects to house makeovers, the Reddit community is a wealth of information and users can comment and ask questions. For those who want a more formal way to learn new DIY skills, Reddit University has a huge number of free classes.

## SNAPGUIDE

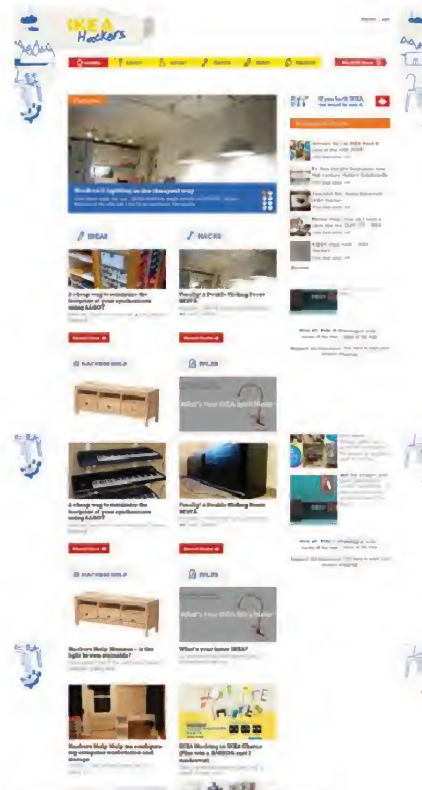
A community of users who create and share step-by-step how-to guides, covering everything from arts and crafts, to cooking dog treats or doing plumbing repairs. Users can also comment to give feedback or ask questions. Snapguide also has an excellent app so you can always access the latest guides.

## THE FAMILY HANDYMAN

Don't call someone to fix that leaking toilet or that other project around the house. The Family Handyman is a huge collection of DIY resources that can help save you money as you repair, replace or upgrade things around the house. It's also got guides for outdoors, such as gardening or building a shed.

## EBOOKS

There are a huge number of free (and paid) eBooks available online, covering just about every DIY topic you can imagine (and a few you can't). Google Play Books and Amazon are a good place to start. Prices range from just a few cents up to hundreds of dollars, depending on topic. ■



IKEA Hackers is a handy website for all your DIY projects. The hardest part is dealing with the IKEA instructions.



# DISCOVER

Discover the best apps for the holidays

[TRAVEL NOW LEAN]

## Best apps for the holidays

MAKE THE BREAK A LITTLE BIT EASIER WITH THESE APPS AND SERVICES.

[TIM BOTHWELL]

FOR MANY OF us, the final ring of the school bell and the closing down of the workplace over the Christmas break brings a sense of confusion, angst and unfamiliarity. Spending time with the family is great and all, but after a couple of days, that joy can turn to frustration as you realise you're forced to spend every living minute with them.

Whether it's early morning rises, frequent drop-offs and pick-ups, or the occasional tantrum (from both you and them), the holidays can

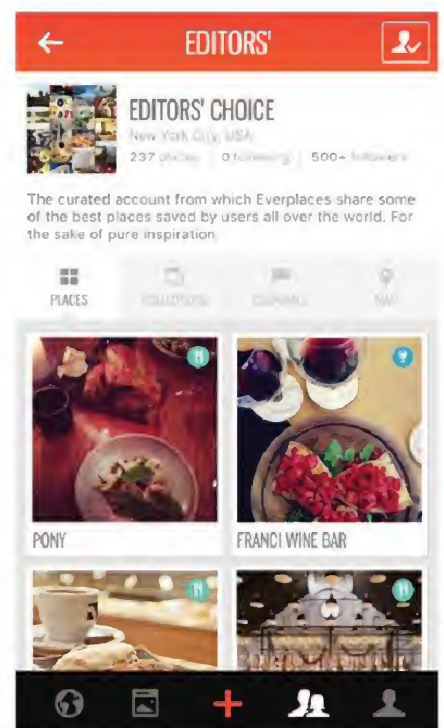
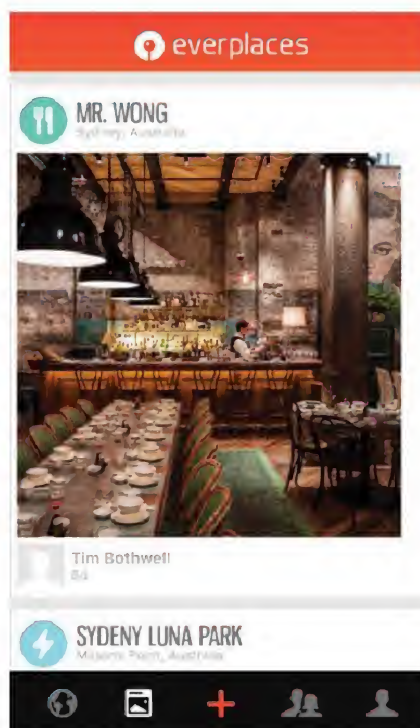
be a contentious time, and for those with children, it can be a trial to get through that six-week-long break.

This month, we've tracked down a selection of the apps to assist you in your holiday-taming efforts — whether that's preparing for a trip away, catching up with friends, or simply finding things to do when the kids are bored out of their minds. Good luck... and may the odds forever be in your favour!



[WEB, IOS]  
**Everplaces**  
Free  
everplaces.com

If you're someone with a growing list of truly amazing destinations that you want to visit in your lifetime, then this app will appeal. Everplaces is a journal-based service that allows you to track and record locations you visit or wish to see in the future. Following sign up, you can quickly and easily search for places from a database of over 90 different countries — whether it's a fancy cat café or hip hotel that you simply must visit. For each destination, you can add photos and notes, as well as organise them by tag or category, with journal entries saved both to the cloud and offline to your device. Lists can be shared with friends and family while you can also choose to follow others for inspiration.







[IOS, ANDROID, BLACKBERRY, WINDOWS PHONE]  
**TRIPIT**  
 Free with IAP  
[www.tripit.com](http://www.tripit.com)

Gone are the days where a holiday consisted of little more than sipping endless Piña Coladas by the pool, with today's vacation often accompanied by hikes, mountain bike rides and sky dives. With this comes the logistical nightmare of trying to organise everything. TripIt assists by taking all your booking confirmations and combining them into a single 'master itinerary'. Simply email all your confirmations to the service and they'll be converted into an interactive itinerary, with directions and maps to each location. The schedule can be saved to your device for offline viewing, and shared. Signing up for a subscription gives you additional features such as real-time flight alerts to ensure you never miss that plane.



[IOS, ANDROID, WINDOWS PHONE, BLACKBERRY]  
**SKYPE**  
 Free with IAP  
[www.skype.com](http://www.skype.com)

The holidays are a great time to catch up with friends but what if they live interstate or overseas? Boasting over 300 million users, Skype continues to be number one for connecting with loved ones over the internet. Available on almost any device (even web browser), Skype allows you to make free video and voice calls to others using your smartphone's camera and microphone. What's more, if someone doesn't have a Skype account or internet connection, the service offers extremely reasonable low-cost calls to mobiles and landlines — useful if you frequently contact loved ones overseas. Like other chat-based apps, instant messages can be sent along with photos, videos, even your current location.



[WEB, IOS, WINDOWS PHONE, KINDLE]  
**TIME OUT SYDNEY & MELBOURNE**  
 Free  
[www.au.timeout.com](http://www.au.timeout.com)

Time off work is often a good-enough excuse to go out and celebrate with friends, and yet, there often comes the challenge of actually deciding what to do. Sure, some people might want to go watch a show at the theatre, but what about the others who'd prefer to hit the dance-floor at that trendy nightclub. Time Out has guides for things to do in either Sydney or Melbourne. Included are a list of nearby restaurants, bars, theatres and events; with many including reviews and ratings. Places can be saved to a list of favourites, while a top-10 section provides a selection of the best of the best places to visit in your chosen city.



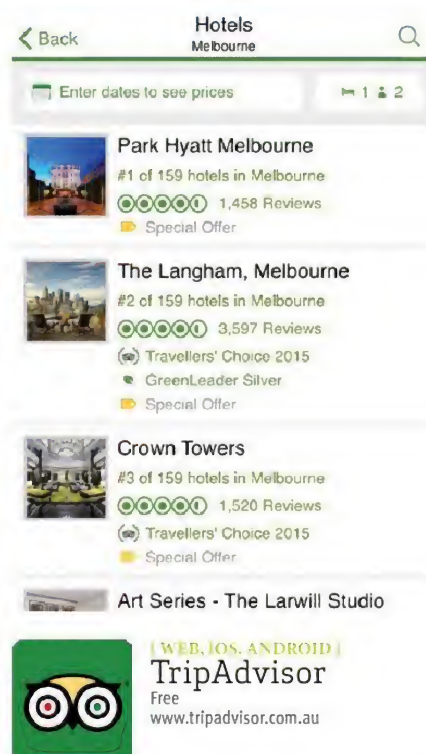
[WEB, IOS, ANDROID, WINDOWS PHONE]  
**Netflix**  
 Free with IAP  
[www.netflix.com](http://www.netflix.com)

One of a number of streaming video services to hit our shores in recent months, Netflix has a library consisting of hundreds of movies and TV shows guaranteed to entertain both you and the kids. The cheapest subscription costs just \$8.99 a month. Following sign-up, you're presented with a highly visual interface displaying a wide range of titles ready to be watched instantly, with the service taking note of your viewing habits to create a list of recommendations likely to appeal to you. One extremely useful feature is the ability to set up multiple user-profiles for different members of the household — ensuring the kids aren't recommended prison drama *Orange is the New Black* nor are you suggested to binge through *The Wiggles*.



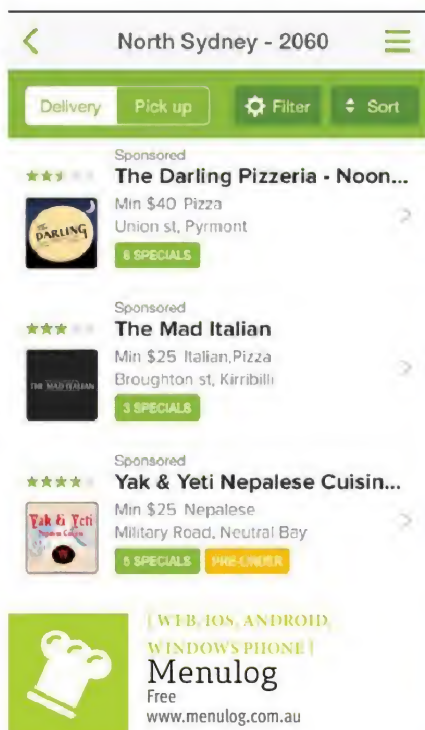
[IOS]  
**Pause**  
 \$2.99  
[getpauseapp.com](http://getpauseapp.com)

As much as everyone makes out the holidays to be a 'fun' and 'enjoyable' occasion, there sometimes comes the feeling of exhaustion and a 'need to drink' as you attempt to keep track of the tiny terrors in your life. If it's only 10am (and you're not an alcoholic) then Pause might be the app for you. Begin simply by placing your finger on the dot and slowly move it around the screen while listening to a truly tranquil soundtrack. Based on ancient principles of Tai Chi and meditation, the scientifically tested app uses patent-pending technology to trigger your 'rest and digest' response, helping you feel relaxed and care-free in no time.

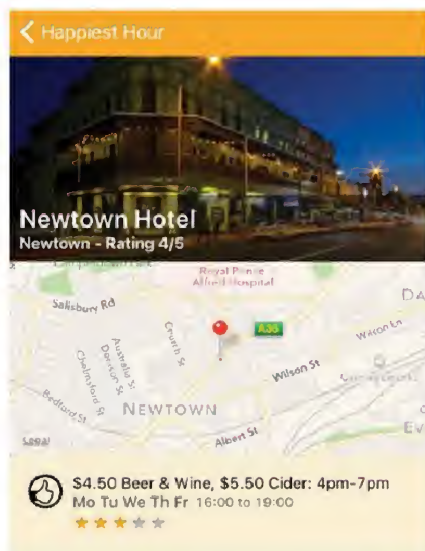


Leaky shower, stained sheets, empty mini-bar — the memories you're likely never to forget following a truly awful stay at that 'cheap and cheerful' hotel. With millions of reviews for accommodation, restaurants and attractions, you'll be sure to find somewhere offering a truly five-star experience anywhere in the world. Search for places nearby or at a particular location and you'll be presented with listings consisting of photos, ratings and other useful information, such as contact details and trading hours. Some even allow you to make a reservation from within the app. Also handy is the ability to save maps and reviews for offline use, helpful if you lack a sizeable data plan for where you're travelling.





Often times, you walk into the kitchen and are horrified to find an empty fridge — suddenly fearful at the sound of footsteps coming towards you to ask the dreaded question of 'what's for dinner'. While you could do a mad dash to the local Coles, why not take the easy/lazy route and order takeaway. Menulog has over 5,000 restaurants eager to deliver to your door. Enter your location to be presented with a list of local food establishments currently taking orders for pick-up or delivery, with searches filtered by cuisine, distance or rating. Each restaurant offers an easy-to-read menu as well as specials, with payment occurring via either cash or credit card. Once you place your order, the service sends you an SMS with the expected time of delivery.



Situated in the heart of Newtown's colourful [WEB, IOS, ANDROID] **The Happiest Hour** Free [www.thehappiesthour.com](http://www.thehappiesthour.com)

The holidays are often a time for some good old-fashioned R&R, or what I like to call 'rest and rosé'. So what better way to end each day with a meal and a nice glass of bubbly or cocktail with this app. The Happiest Hour features a community-developed list of food and drink specials for hundreds of bars and pubs across Australia (and New Zealand). Using your phone's GPS, you're provided with a map showing listings for nearby places that offer discounted food and drink items for different days of the week. Results can be filtered according to food, cocktails, wine, even coffee; with venues and deals being rated out of five.



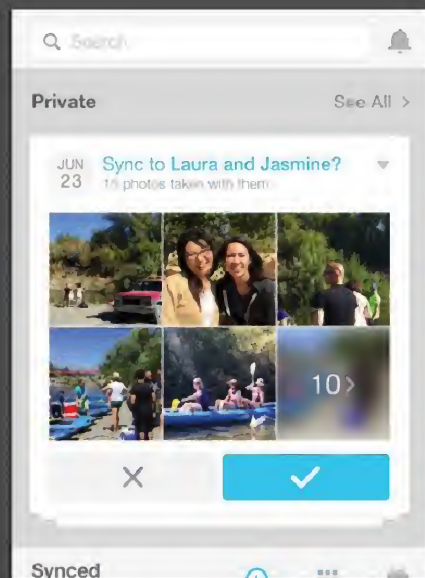
[WEB, IOS] **Groupon** Free [www.groupon.com.au](http://www.groupon.com.au)

It's common for your bank account to take a financial battering come holiday time, especially if you're already feeling the financial pinch. Groupon is a deals site where discounts range from 50% to 70%, meaning you'll be sure to find somewhere to go, something to do, even something to buy whatever the occasion. Categorised into travel, goods and nearby offers, deals can be searched for by location or product type — such as food, beauty, even fitness. Deals can be bought and paid for all from within the app, as well as be redeemed at a later date. Whether it's a three-course feast, Cleopatra facial or fancy-smelling candle, you'll be sure to find something that appeals to you (and your family).



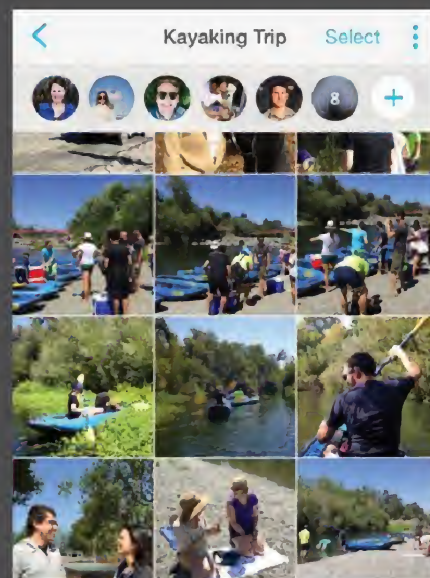
[IOS, ANDROID] **MOMENTS** Free [www.momentsapp.com](http://www.momentsapp.com)

It's often in the days following a birthday, wedding or night out on the town that you receive countless requests from friends to send you all the 'beautiful' selfies they took on your device. Rather than painstakingly send each one using good old MMS, why not try this app. Created by Facebook, Moments uses your camera roll to highlight the photos that feature your Facebook friends. Simply grant the app access to your photo library and the service will use facial technology to analyse your snaps and identify other people — organising them into galleries for quick review. Albums can be shared with select friends, plus shots can be saved to their camera roll or sent to Facebook or Instagram.



[IOS, ANDROID] **KAYAKING TRIP** Free [www.kayakingtrip.com](http://www.kayakingtrip.com)

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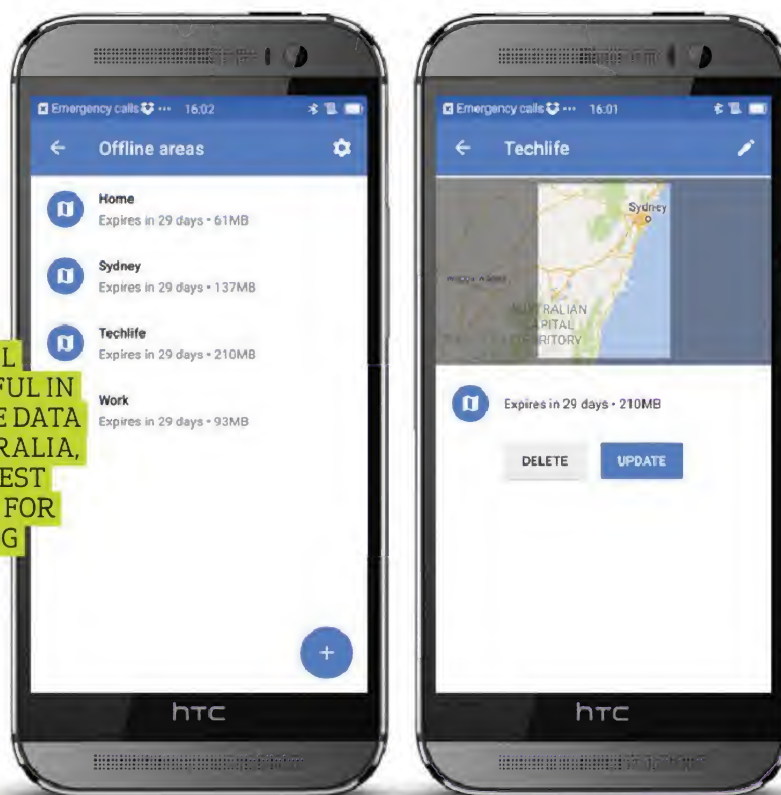


[IOS, ANDROID] **KAYAKING TRIP** Free [www.kayakingtrip.com](http://www.kayakingtrip.com)

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OFFLINE MAPS WILL UNDOUBTEDLY BE USEFUL IN REDUCING YOUR MOBILE DATA CONSUMPTION IN AUSTRALIA, BUT ONE OF THE BIGGEST ADVANTAGES WILL BE FOR PEOPLE TRAVELLING OVERSEAS.



[ ROUND, ROUND, GET AROUND ]

# Google Maps

A NEW OFFLINE MODE MAKES THIS ONE OF THE BEST FREE SATNAV OPTIONS... AND MEANS YOU WON'T FALL OFF THE EDGE OF THE (GOOGLE) EARTH WITHOUT A DATA CONNECTION.

[ JOEL BURGESS ]



**[ ANDROID, IOS COMING ]**  
Google Maps  
CRITICAL SPECS  
Free | [google.com.au/maps](http://google.com.au/maps)

PRIOR TO THIS recent update of Google Maps, the most useful navigation application for smartphones was the Nokia-developed HERE Maps — an app that we've covered a few times previously in TechLife and that's generally highly regarded elsewhere too. One of the key benefits that HERE Maps paraded over Google's ubiquitous service was the ability to download maps and use them offline. Though you could do this to some degree with Google Maps — you could pre-load a specific route or journey and could follow the GPS navigation while offline — if you strayed off course or wanted to look at something outside of this preconfigured path, you would very quickly find yourself running out of map. In November, though, Google finally announced that the world's favourite mapping application would make it's sophisticated maps downloadable and available offline.

And it's not just your local maps either. You can save every street in your city or even your country (well, kind of) onto your smartphone,

meaning you can have access to Google's directions when you have no cellular data and no Wi-Fi coverage. Though this offline mode is currently only available to Android users, the company has stated its intentions to release the update for iOS devices in the near future.

After updating to Google Maps version 9.17.1, an 'offline areas' section will appear in your sidebar menu, where you can add locations from a recommended list of regulars, or choose to manually add a custom area yourself. Though the company said you can download an entire country's maps, we found we were only able to download a rectangular area roughly as far apart as Sydney and Canberra — so Google's statement is technically accurate, but only if you live in the Vatican, Monaco or Naru. This consumes around 210MB of space on your phone, too... that's a decent chunk if you have a smaller smartphone with less space. It's worth noting that in more densely populated areas or somewhere with less coastline, maps could reach up to 400MB. Also worth noting is the fact that offline maps expire after a month, though you can set offline maps to automatically download updates before they expire.

Offline maps will undoubtedly be useful in reducing your mobile data consumption in Australia, but one of the biggest advantages will be for people travelling overseas. Data in foreign countries is expensive, but it's rare for you to ever have a good idea of where you're going (and how to get there) when you're in a foreign land. Seeing as maps can be hundreds of megabytes, it doesn't take long to chew through the measly amount of pre-paid data you bought *just in case...* or receiving a hefty roaming data bill when you get back.

Offline maps store a surprising amount of data in offline mode, allowing you to see significant locations and retail outlets on the map, and even tap through to see further details including opening hours, contact numbers and written addresses. There is even a manual measuring tool that can be used when you don't need specific directions, but want to know how far away something is.

Google Maps' offline mode doesn't dominate the interface when you open the app — there's only a prompt to download your regular locations when you open the updated version of the app for the first time — so it's easy to miss. But do take note, because this addition is a massive upgrade to what was already an amazing app. ■



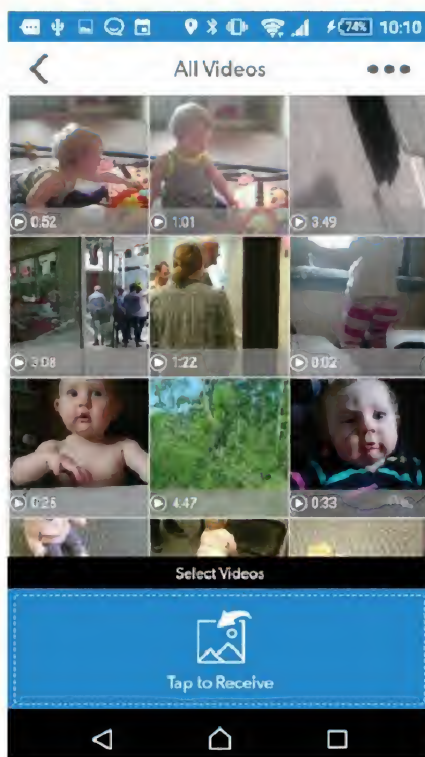
[LATEST APPS]

# Magnificent new multiplatform apps

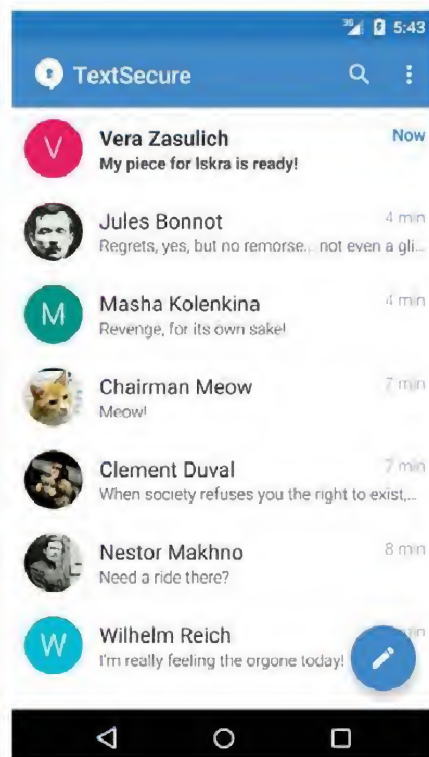
THE TECHLIFE TEAM UNCOVERS THE BEST NEW PLATFORM-AGNOSTIC APPS FOR ANDROID AND IOS.



If you have a Mac computer and an Android smartphone, making sure your phone is backed up and synced with your computer can be a chore when compared with the simplicity of turning on iCloud. At the helm of Upthere is Bertrand Sertlet, former Senior Vice president of Software at Apple, which makes the foundations of this app a little more solid. Upthere offers cloud syncing between any number of devices through the home app and lets you look through your stored music, photos and documents from any device. The Upthere Home app is initially set to back catalogue any of the images, documents and music your phone stores locally and it'll also allow you to create a shared media folder with any email address. At the moment, the app is still in beta and although it's both free and works well, it isn't really feature rich or different enough from existing options to go gangbusters just yet. [JOEL BURGESS]

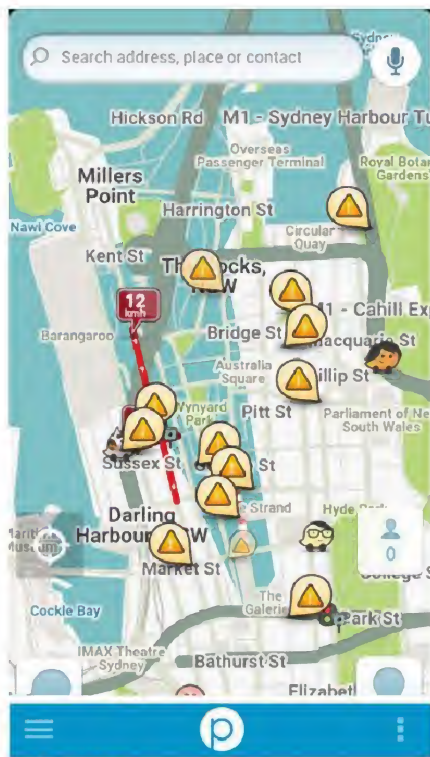


In 2015, if you need to get an image from one device to another, you have plenty of options, and let's face it, none of them are hard. You can send an email, a text message or upload it to one of dozens of cloud services. But what if none of those are convenient enough? How do you shave whole microseconds off the getting-a-photo-to-someone-else chore? That's where FotoSwipe comes in. It's a pretty nifty image-transfer app that lets you move images from one phone to another — whether Android or Apple — by simply swiping said image in the direction of the other device. With FotoSwipe installed on both devices, this is achieved with a Wi-Fi connection. Your image is uploaded to the FotoSwipe cloud, transferred to the other phone's app, and then (or so the developers claim) promptly deleted from the FotoSwipe servers. It's pretty cool and the interface is actually really clever, but the app needs to catch on in order to be useful. [SHAUN PRESCOTT]

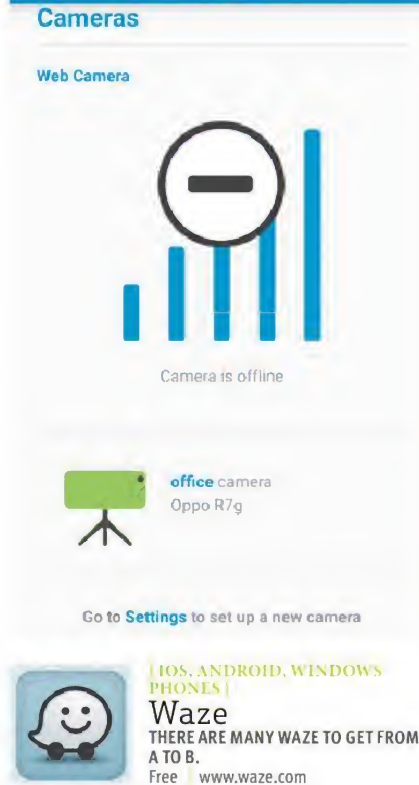


Signal is another messaging application using privacy as a selling point, but this crew seems particularly dedicated. The source code is available on GitHub, and the app appears to be an act of benevolent activism, as it's not monetised at all. Download the messenger, put in your number and it'll list your contacts who already have the app. The problem is, unless you're part of some shady underground hacking organisation, none of your friends will have it, and you might have a hard time convincing them. But if you've started up a moonshine racket and need an easy way to coordinate your drop-offs, this app should suit you. It sends texts (via data), video and voice messages, and is as stripped back and user friendly as both Apple and Android's stock messaging systems. According to the devs, "the server never has access to any of your communication and never stores any of your data", but as always, we can't guarantee that is true. [SHAUN PRESCOTT]

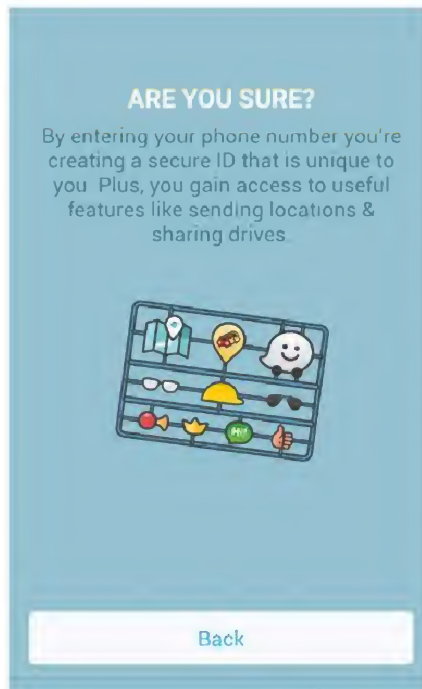




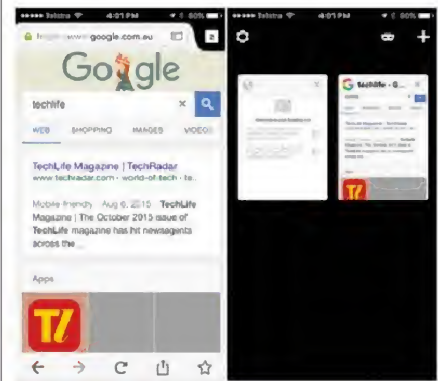
THE STREETS ARE NOT ONLY ACCURATE BUT ALSO POPULATED WITH CURRENT ROADWORK WARNINGS, SPEED CAMERAS, RECENTLY SEEN POLICE CARS, CURRENT TRAFFIC CONDITIONS, FUEL PRICES AND OTHER UP-TO-DATE NOTES THAT CAN COME IN HANDY WHEN DRIVING.



The first time we gave Waze a whirl, we really couldn't work out what the hype was about... the underdeveloped app was not only lacking accurate Sydney street maps, but it was also devoid of a local community, something that its whole premise hinges around. After the company recently boasted of a major redesign that would affect the Australian version, we were intrigued to take another look but were initially plagued by a couple of glitches. Though you can access the app without the initial step of using your mobile number to verify your account, if you don't, you're locked out of a couple of features, like sending your current



location to others and sharing driving routes. The good news is that Waze's 'social road' approach seems to have caught on a little more since the app's refurbishment, and the streets are not only accurate but also populated with current road work warnings, speed cameras, recently seen police cars, current traffic conditions, fuel prices and other up-to-date notes that can come in handy when driving. There's definitely a lot more local content on here since the last update, and in its current state it's not a bad little free navigation app. [JOEL BURGESS]



[IOS, ANDROID, WEB BROWSER]  
**Firefox**  
CAN THIS FOXY BROWSER TACKLE THE IOS PLATFORM?  
Free | [www.mozilla.org](http://www.mozilla.org)

Firefox maker Mozilla has for many years held off developing a version of its popular browser for iOS — largely due to Apple's strict regulations that force browser-developers to use the Safari's rendering and Javascript engines. Mozilla has finally decided to jump onto the App Store. Firefox for iOS is a slick-looking mobile browser that has a responsive multi-tab interface and all the history, bookmarks and personalisation features that you expect from a web browser. It also has a useful reading mode that makes articles easier to read by stripping anything but the text from web pages and formatting them in one easy-to-read typeface. With a companion reading list that works like a bookmark folder for this reading section, you can fill it up with pages and cut down on data use while you're out of Wi-Fi range. All up, this is a pretty decent browser option, but when you consider it's not much more than a customised shell of Safari (much like Google's Chrome on iOS), we're not sure there is enough here to justify the jump from iOS's default choice. [JOEL BURGESS]



[IOS, ANDROID]  
**YouTube Kids**  
A RICKROLL-FREE SAFE ZONE SUITABLE FOR THE YOUNG'UNS.  
Free | [www.youtube.com](http://www.youtube.com)

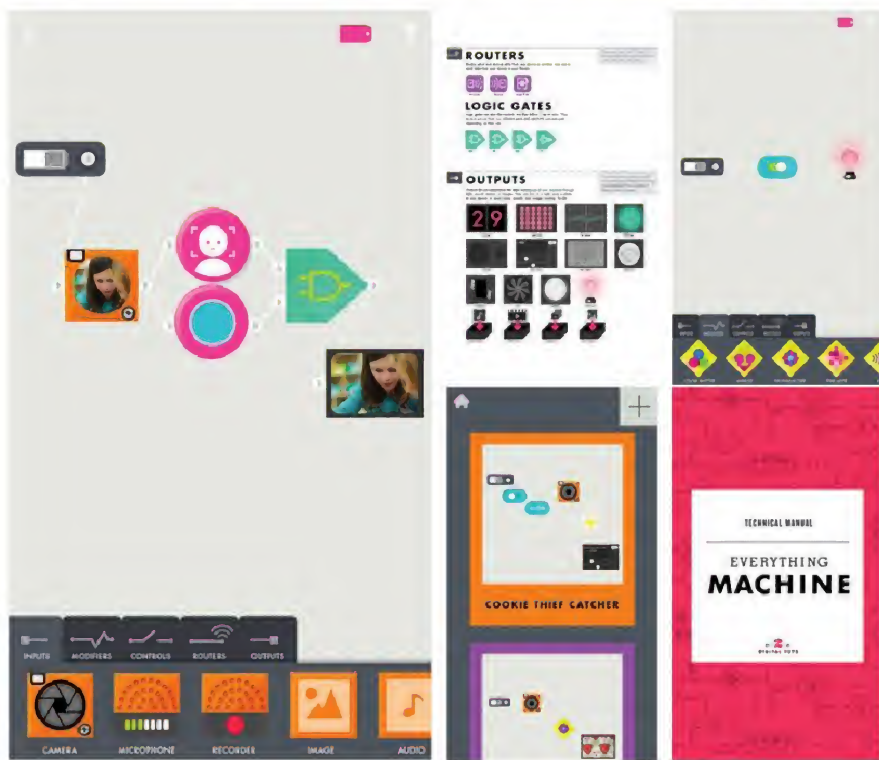
Few things pacify children like a screen, which is why the likes of Netflix, Stan and ABC iView have whole sections of their video on-demand services dedicated to kids. Now YouTube has waded into the kids-only realm. There are plenty of tools available to limit your child's access to material: you can bar the search function, which keeps the floodgates well and truly closed and YouTube's own curated content at the forefront. When we tested the app shortly after release, this seemed to comprise mainly of ABC Kids and DreamWorks stuff, organised into four categories: Shows, Music, Learning and Explore. It's a neat app, but the more heavily curated experience found on ABC iView and Netflix feels like a safer bet if you want peace of mind that your kids won't get into anything over their age. Oh, and we double-checked: you can't access Rick Astley videos through this app. [SHAUN PRESCOTT]



[LATEST APPS]

# Impressive new apps for iOS

THE LATEST MUST-HAVE APPS FOR YOUR iPhone AND iPad!



**[iOS]**  
**The Everything Machine**  
THERE'S EVEN A DIGITAL KITCHEN SINK...  
\$4.99 | [www.tinybop.com](http://www.tinybop.com)

Digital toy designers tend to cater for younger users; they probably presume older ones prefer “proper” games. Tinybop thinks that’s left a gap, to be filled by The Everything Machine.

You might mistake this for an educational app about basic electronics. There are batteries, bulbs and beepers to connect, with logic gates between. Then you spot what else you can hook into your circuits. A camera, tilt and motion detectors, transmitters and receivers: this app lets you program your entire device.

It’s a scribble pad for budding developers, with the potential to explode your creative world. This isn’t just turning bulbs on and off — you can catch cookie thieves using a light sensor, a camera and your photo store, or make a detector that tells colours apart.

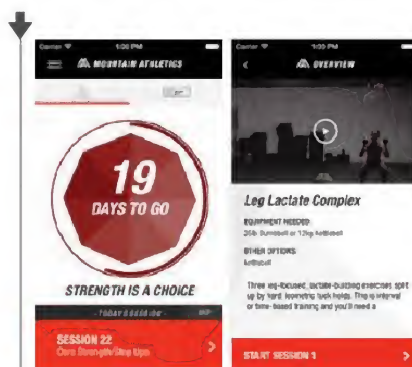
At this point, full of a hundred ideas, you and your kids will set to work — and you’ll hit

a snag. The examples and short manual aren’t enough to understand such a powerful toolkit. Apps for younger kids are simple enough to learn by exploring. This isn’t.

It is worth the effort, though. It’s not just the range of things you can build that’s so enchanting — it’s the satisfaction of building it yourself.

One of our best creations was a simple sound studio. With some switches and a bank of speed- and pitch-changer tools, we could remix our favorite songs to our heart’s content. We could have done the same with specialist software, but it’s much more gratifying to work with tools of your own making.

Not only will you have fantastic fun with this app, you may help raise the next generation of programming wonderkids, too. [MATT THROWER]



**[iOS]**  
**MOUNTAIN ATHLETICS**  
BY THE NORTH FACE  
GET.  
FREE | [thenorthface.com](http://thenorthface.com)

There are loads of training apps out there, but very few of them are targeted toward getting fit for specific mountain-based and high-altitude activities. It may sound niche, but don’t discount it yet — this is the kind of training you generally need to pay a trainer to get. Plus, who doesn’t love the idea of taking off to the snow for the winter with the kids, taking that dream holiday and hiking to Everest Basecamp or even something as simple as running your first 5kms. You’re going to need the legs and the steam to do it and this is where this great companion app comes in. The timed, circuit-based workouts are split into six individual sports; running, general fitness, alpine climbing, rock climbing, backcountry skiing and all-mountain skiing. Each program is six weeks long and asks you to commit four days a week to get the best results. You’re also going to need access to a gym or at the very least some basic equipment at home as you squat, lunge, press, run and Scotty-Bob yourself to fitness and holiday fun. [TROY COLEMAN]



**[iPhone, iPad]**  
**CLOUD OUTLINER 2 PRO**  
A WELL-DESIGNED OUTLINES TOOL.  
\$4.49 | [www.xwavesoft.com](http://www.xwavesoft.com)

Capturing ideas in the form of outlines is one of those things you either do as a matter of course, or you don’t. Cloud Outliner won’t change that, but if you’re in the former camp, it provides a way to put together outlines on the move very easily, and sync them with Evernote or a version of Cloud Outliner on another device.

It looks great, and its support for gestures, as well as its well-designed user interface, make drawing up outlines super easy. For example, to indent or un-indent an entry, you need only drag it right or left and it sticks. If you’d rather press a button, you can.

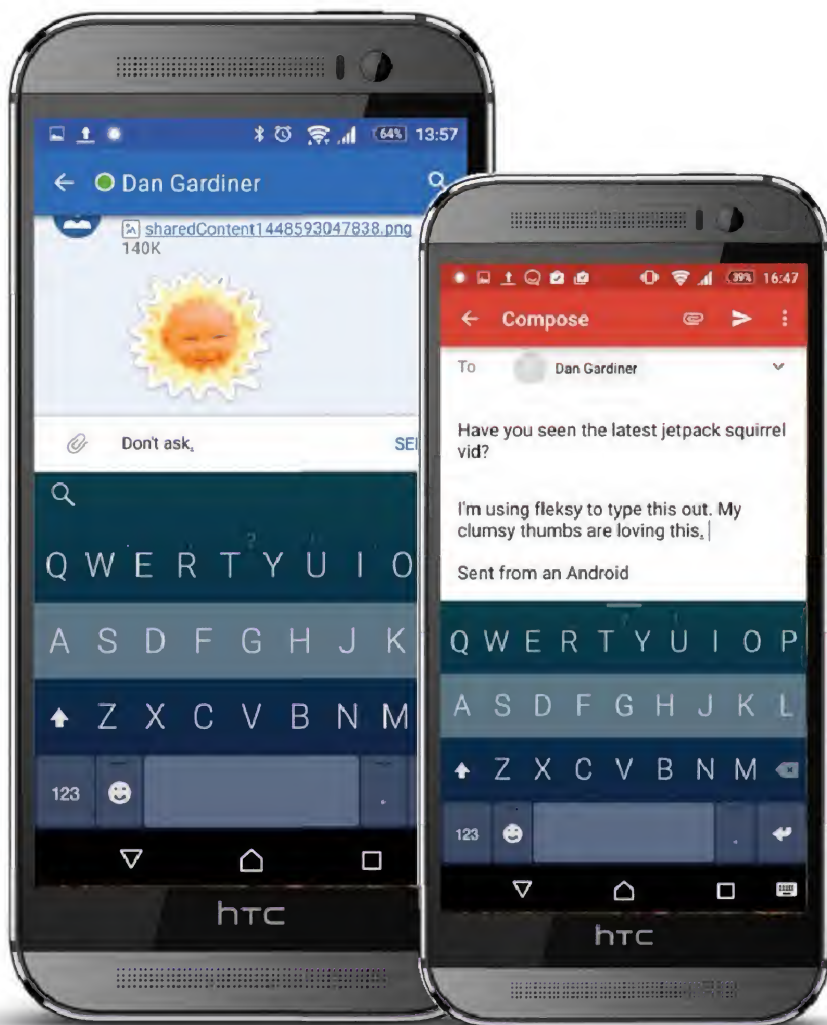
There are plenty of options for refining the look of outline documents, including a choice of light or dark themes, and there are also options to use colours for entries.

If you’re a regular outliner and don’t yet have a go-to app, Cloud Outliner could be the one you’ve been looking for.

Creating and formatting outlines couldn’t be any simpler.

[KENNY HEMPHILL]





[ LATEST APPS ]

# Agile new apps for Android

WE DIG UP THE HOTTEST NEW APPS FOR ANDROID PHONES AND TABLETS.

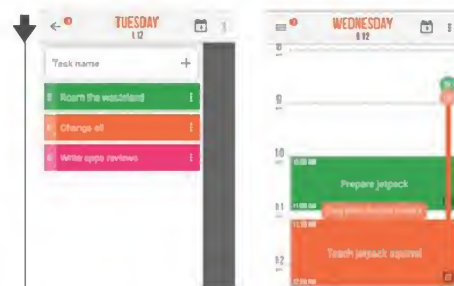


[ ANDROID ]  
**Fleksy + GIF keyboard**  
AS EASY AS RSSY.  
Free with IAP | fleksy.com

That cunning sell is a hint. Fleksy, you see, is a keyboard app that relies on swiping up, down, left and right to correct what you're typing out, and after a half a day of readjustment, it becomes second nature. All of it comes down to the controls, and that large, friendly, keyboard. Swipe down after you've mangled what you're meant to write and you'll cycle through a list of alternatives. Swipe up and you'll go back through the words to undo your correction, and eventually add your new word to the dictionary. Flick left to delete the entire word, and right to add a space. While the

keyboard takes up a fair amount of screen real estate, you can do a double swipe down to get rid of the space bar — useful when flicking right has become second nature. And if words aren't enough, the keyboard's also loaded with emoji, imoji (vector art) and GIFs to insert into your texts and emails. The last three are a gimmick, though the keyboard alone should speed up your text messaging, especially if you're loathe to use a trace to type style 'board (a function that Fleksy does not offer).

[ PAUL TAYLOR ]

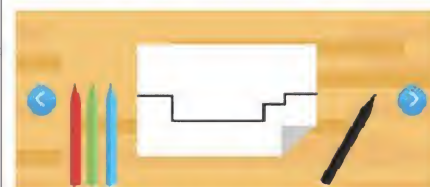


[ ANDROID ]  
**ACCOMPLISH**

CHECK OUT THIS CHECKLIST? CHECK!  
Free, with IAP  
[www.accomplish-software.com](http://www.accomplish-software.com)

Calendar reminders are all well and good, though there's nothing quite like a checklist. While many TechLife staffers use Google Now or Colornotes for short-term notes, Accomplish lets you write out tasks and then assign them to its calendar, or have them rest in a list for you to work your way through at your leisure. Accomplish will sync with your regular Google calendar, with the app's big, bold interface marking out when the task starts, and when to remind yourself that it's coming up. We found it useful for jobs that require a bit of time — like, say, an afternoon to write a story about apps, or putting several hours aside to practice a new skill — and having a visual, colour-coded list really focuses what to prioritise and when. Accomplish is limited in that there is no month overview, so if you want to plan ahead, you'll have to flick through every single day, one at a time. However, it's very fast and easy to set up.

[ PAUL TAYLOR ]



Draw your floors and walls in black

2/9



[ ANDROID ]  
**DRAW YOUR GAME**

FUN INK-CORPORATED.  
Free, with IAP | [www.tinyurl.com/tla46-draw](http://www.tinyurl.com/tla46-draw)

Grab your pens and paper, because half of this platformer requires you to create it yourself. Black lines mark the hard, immovable parts of the world, while blue objects can be moved around as soon as your character touches them. Green shapes act as jump pads, while red objects will kill you as soon as you touch them, or can be used as a goal into which you feed the blue objects. If you've ever played Crayon Physics Deluxe, you'll have a good idea of what to expect here. Once your world is drawn on your physical bit of paper (or you can opt to play the 'adventure' mode with pre-set levels waiting), you can take a photo of it, from which the app builds the level. From there, pilot your character either to the exit, or destroy a set of blue objects. It's simple stuff — all you can do is move left, right and jump. It'll hardly trouble Mario for satisfying platforming, but with some imagination, you can create some pretty tricky (and very large) levels before publishing them for the world to enjoy.

[ PAUL TAYLOR ]

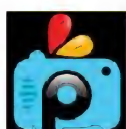




[ LATEST APPS ]

# Wicked new apps for Windows Phone

GET THE BEST NEW APPS FOR YOUR MICROSOFT-DRIVEN SMARTPHONE.

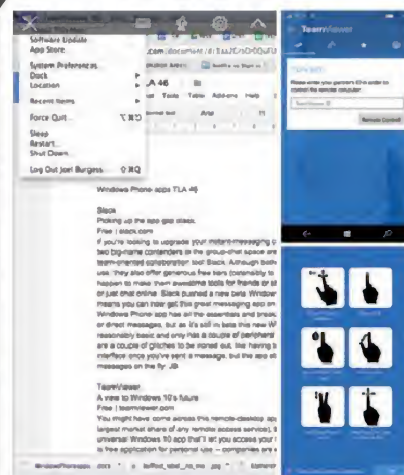
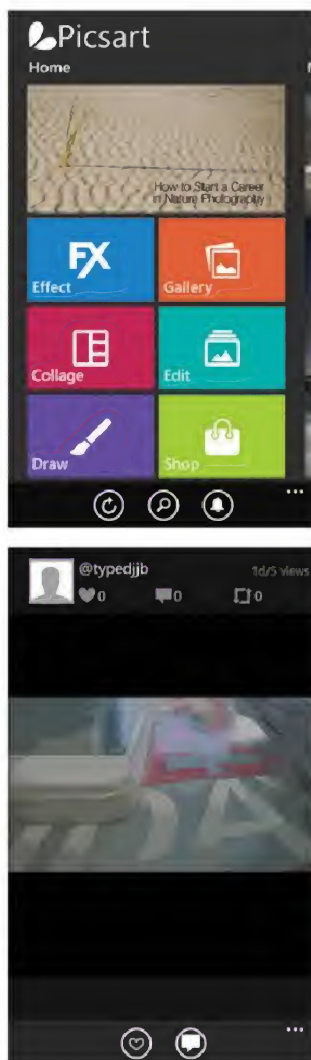


[ WINDOWS PHONE ]  
**PicsArt**  
THE SMARTPHONE PICASSO.  
Free | [www.picsart.com](http://www.picsart.com)

This well-known Android and iOS photo-editing app has received a major update on the Windows Phone platform, which not only makes it a stable universal 'Windows 10 for Mobile' app, but also brings the Windows Phone offering in line with the other smartphone platforms. Much like Instagram, PicsArt is a photography companion app aimed at sharing photos online, managing the process all the way from taking the shot itself through to editing and eventually sharing it on your PicsArt profile. The comprehensive editing suite has

a full set drawing effects, allowing you to create art from scratch or tweak photos. Then there's a second editing level, which allows you to add further effects and filters. There are some pretty amazing customisations that can transform mundane objects into engaging images. This free app also plugs into a wide variety of social media apps, so even if you don't want your pics to join the other 250 million odd images on the service, PicsArt makes for a great editing tool on its own.

[ JOEL BURGESS ]



[ WINDOWS PHONE ]  
**TEAMVIEWER**  
A VIEW TO WINDOWS 10'S FUTURE.  
Free | [www.teamviewer.com](http://www.teamviewer.com)

You might have come across this remote-desktop app already (TeamViewer boasts the largest market share of any remote access service), but the company has just released a universal Windows 10 app that'll let you access your PC from your smartphone. TeamViewer is a free application for personal use — companies are expected to voluntarily pay up if it's used for commercial purposes — and once you download the app onto your PC and your smartphone, there's no need for account setup. Remote login simply requires you to run the app on your PC and then copy the computer ID and randomly generated password from the screen to your smartphone. A couple of settings allow you to change the picture quality or whether the connection favours visual quality or a continuous frame rate, but other than that, the interface is streamlined. An initial prompt will give you a refresher on how the controls work for moving the cursor using your smartphone, and the 15% speed boost the company boasts with the upgrade makes for an improved user experience. [ JOEL BURGESS ]

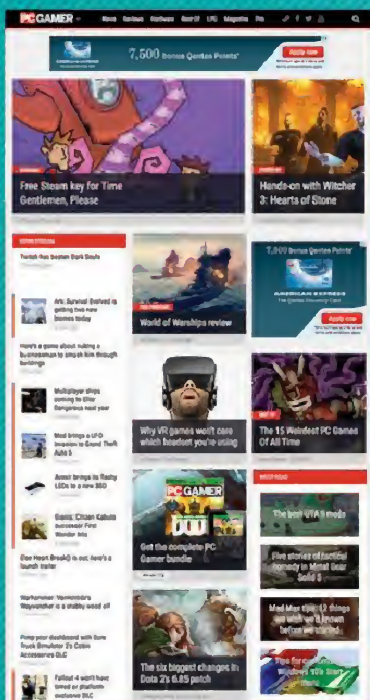


[ WINDOWS PHONE ]  
**SLACK**  
PICKING UP THE APP GAP SLACK.  
Free | [www.slack.com](http://www.slack.com)

If you're looking to upgrade your instant-messaging chops, the two big-name contenders in the group chat space are Aussie-made HipChat or the team-oriented collaboration tool Slack. Although both these apps largely target workplace use, they also offer generous free tiers (ostensibly to entice business subscriptions), which make them awesome tools for friends or study-groups to collaborate on projects or just chat online. Slack pushed a new beta Windows Phone app out in November. The app has all the essentials and breaks down chats sections into either rooms or direct messages, but as it's still in beta, this new version is reasonably basic and only has a couple of peripheral settings that can be tweaked. There are a couple of glitches to be ironed out, like having to push the back button to exit the typing interface once you've sent a message, but the app still functions and will let you type Slack messages on the fly. [ JOEL BURGESS ]



# SMARTER COOKIES ENABLED



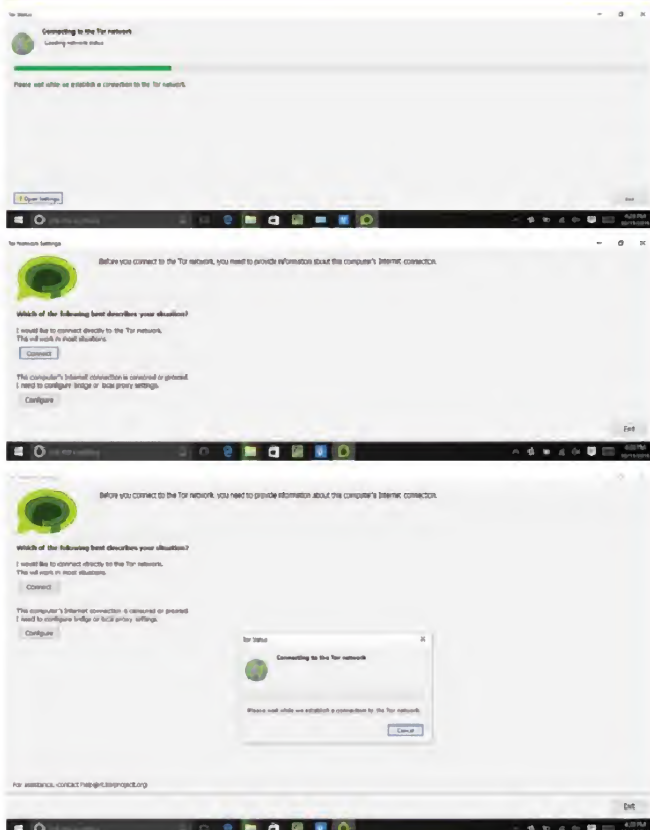
JOIN US ONLINE AT  
**WWW.PCGAMER.COM**



[ BEST APPS AND SITES ]

# Unearthed

THE *TECHLIFE* TEAM'S FAVOURITE NEW SITES, SERVICES, BROWSER PLUGINS & OTHER HANDY TOOLS.



[ SECURE MESSENGER SYSTEM ]

## Tor Messenger

HIDE YOUR CHATS BEHIND ONION BREATH.

Free [tinyurl.com/TLA46-TorM](http://tinyurl.com/TLA46-TorM)

For the past couple of years, the devs behind the popular internet encryption software Tor (The Onion Router) have been working on a stand-alone secure messaging system that was finally launched in a beta version in November. The new Tor Messenger taps into popular existing messaging apps like Facebook Messenger, Google Talk and Twitter to name a few, and diverts information coming from your IP address through Tor's series of encryption layers and IP relays before reaching the messenger's servers. The Tor Messenger is built off the back of Mozilla's instant-messaging app Instantbird, and though there are some parallels between Tor and other multiplatform chat clients like Adium and Pidgin, Tor is different in that its default setting will only allow chats where both users are running chats through the Tor system — without which your chats won't be completely encrypted. One other major distinguishing feature between Tor and other apps that use this 'Off-The-Record' protocol is that Tor does not log any chats and requires users to enter a mutually established password before any dialogue can be entered into. This one might require a little more technical skill than your average app, but instructions can be found on the Tor Project website.

[ JOEL BURGESS ]



[ PODCAST ]

## The Dollop

NO SLEEP 'TIL HIPPO.

Free [thedollop.libsyn.com](http://thedollop.libsyn.com)

The popularity of podcasts is on the rise and the best one I have heard by far is *The Dollop*. This is a biweekly podcast hosted by comedian Dave Anthony who tells a bonkers American history tale to his permanent guest star Gareth Reynolds. The topics covered are diverse to say the least — racism, corruption, epic journeys of survival, ye olde medicine, cults, crazy fans, ghosts, lone-man rampages, sportsmen who fell from grace, the origins of cereal (I haven't touched Corn Flakes since), gangsters, the first woman to publicly wear pants, exorcisms, meat rain (yep, you read right), indestructible emus, the rise of the LAPD, actor fights, archaeologist fights, competitive tickling and so much more! It's the perfect thing to listen to on a lunchtime walk, a boring commute, to keep you awake at work or while you're being domestic at home. Most episodes are stand-alone affairs, so you can start wherever you wish, but be prepared... your laughing muscles are going to be seriously sore by the time these boys have finished with you! [ CARMEL SEALEY ]

[ WEBSITE ]

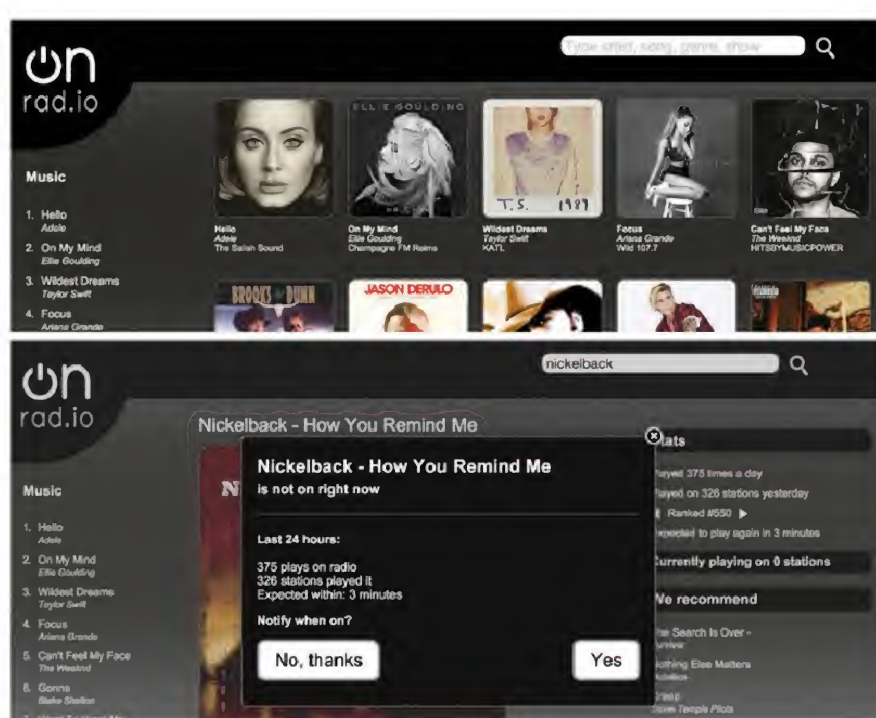
## About Me

GOOGLE+ WITH A DIFFERENT NAME.

Free <https://aboutme.google.com>

The premise of this tool is to consolidate all of your public information that is stored across Google-owned sites (such as Gmail, YouTube, Drive, Google Play and Maps etc.) without the need for Google+, though that social playground is still available. Depending on how much information you have already given Google, when you first look at About Me, it could look either fairly sparse or vastly populated. If you have a Google+ account, all the personal information you see in About Me is also stored in your + account. If you change something in this view, those changes will be shown across all Google services. Quite handy. However, if you wish to remove all your information, there are limits to what Google will let you delete. It will not allow you to have a blank profile, for example — you must have a name, a photo and a date of birth. What this new tool means for Google+ is uncertain at present, but it's undoubtedly a useful way to edit your online profile. [ CARMEL SEALEY ]





## [ WEBSITE ] OnRad.io

CAN'T STREAM TAYLOR SWIFT? HERE'S A WORKAROUND.

Free | [onrad.io](http://onrad.io)

Still reeling from the absence of Taylor Swift's new record from Spotify and Apple Music? OnRad.io might have you covered, but only just. This search engine allows you to search for any artist or song, and if what you're looking for happens to be streaming on one of millions of digital radio shows, OnRad.io will hook you up in seconds. Of course, there's no guarantee you'll hear the song in its completion, as digital radio works in much the same way traditional radio does. Cruel

world, hey? While it's not a perfect compensation for those looking to stream artists reticent towards streaming, it's actually a pretty neat discovery tool if you're into more obscure music. Just say you have a hankering for some Georgian folk music but have no idea where to look for it, you can plug an artist or song into OnRad.io and it'll spit out radio stations most likely to play stuff like that. A neat, if niche, search tool.

[SHAUN PRESCOTT]



## [ CHROME BROWSER ] Infinity New Tab

EXTENDING BROWSER FUNCTION.

Free | [tinyurl.com/TLA46-NTab](http://tinyurl.com/TLA46-NTab)

This isn't the first Chrome extension to have a crack at making your new tab page more useful than the stock Google landing page, but Infinity New Tab does offer a new set of tools that'll let you customise your browser to the nines. As the name suggests, Infinity New Tab (INT) will open in your Chrome browser whenever you click to open a new tab, and it houses an interactive page with a customisable list of web apps and pages. After tweaking your theme or applying your chosen wallpaper, you can also

toggle your preferred search engine for the on-page search bar (and add additional custom ones like tech price search engine staticICE), add your regularly used web apps and even save a backup recovery file of your INT layout to your computer. With a broad selection of apps and tools to draw on from an easy sidebar tab and the ability to backup your settings via a free cloud account, INT is a worthwhile free upgrade to the stock Chrome new tab landing page. [JOEL BURGESS]

[ WWW.TECHLIFE.NET ]



[ CHROME PLUGIN ]

## F\*CK IT

NO MORE TEDIOUS INVITATIONS TO LOG IN.

Free | [tinyurl.com/pq2a27h](http://tinyurl.com/pq2a27h)

There are few things more annoying than unsolicited invitations to log in to websites you don't want to log into. It really makes you want to spray expletives, doesn't it? Well, this Chrome extension not only blocks those annoying log-in prompts, but it swears for you as well. I hope Sweden is reading this, because I detect a Nobel prize winner in our midst. As with most Chrome plugins, it's a simple matter of toggling F\*ck It on or off in a mini-menu, but let's face it: you probably aren't going to be turning this off.

[SHAUN PRESCOTT]

[ WEBSITE ]

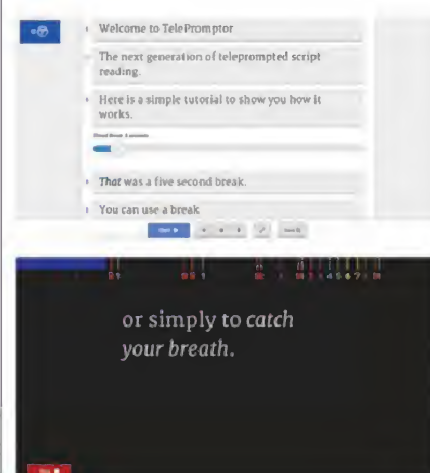
## TELEPROMPTER

SPEAK MUCH GOODER.

Free | [www.teleprompter.com](http://www.teleprompter.com)

If you have trouble sounding authoritative or even vaguely civilised when giving speeches or presentations, Teleprompter is a useful tool for sounding better. The name says it all: it's a teleprompter (those things newsreaders use) for your computer screen, and it presents text in a manner that helps you enunciate words better, placing emphasis in the most effective places and helping you never trip over a sentence again. You do have to know how to read, though. It comes either free, or with a \$29.95 premium package offering more delivery types.

[SHAUN PRESCOTT]





It's possible to kill these things but probably not at this range.



[ GAMES ]

# Wasteland opportunity

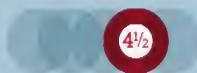
THE **TECHLIFE** TEAM REVIEWS THE LATEST GAMES ON PC AND CONSOLES, STARTING WITH THE MUCH-ANTICIPATED RETURN OF THE **FALLOUT** SERIES.

[ SHAUN PRESCOTT ]

## Fallout 4

BACK TO THE WASTELAND, BUT HAS ANYTHING CHANGED?

From \$79.99  
PC, PS4, Xbox One  
[www.fallout.com](http://www.fallout.com)



BETHESDA HAS A knack for turning their complicated, ostensibly “hardcore” RPGs into pop culture phenomena. Ever since *Skyrim* launched into an unexpected flurry of mainstream attention in 2012, thousands of *Fallout* fans have hard-refreshed their RSS feeds in the hope of a smidgen of *Fallout 4* news. Now that it's finally here, it's kind of unbelievable.

*Fallout 4* can't possibly live up to expectations. First impressions are dire: this is the same engine that powered *Skyrim*, and all of its many supposed shortcomings are on display — character animations are stilted, AI behaves erratically (psychotically at times) and the world itself, while beautiful, can't hope to compete with other Triple A titles.

The thing is, those drawbacks exist because Bethesda still creates RPGs with a level of interactivity unparalleled in mainstream gaming. After a couple of hours griping about the non-photorealistic graphics, it's hard to resist the familiar groove of a *Fallout* game, only this time, there's more of it. The Boston wasteland is much denser than any preceding Bethesda sandbox, with a more diverse range of mutated fauna and a greater focus on

looting. Indeed, even trash is important in this instalment, as it feeds into a new crafting system that not only powers your weapons and armour, but also homesteads. Buildable terrain is scattered throughout the wasteland, and while it's possible to ignore the micro-management aspects of *Fallout 4*, it's also possible to waste hundreds of hours building a replica of the Deathstar in an abandoned drive-in cinema.

Exploration really is the best aspect of *Fallout 4*. Sticking to the main questline will reveal only a small fraction of what's appealing about the series. As always, it's the random encounters and diverging paths that matter most, and therein lies an enduring conflict in the *Fallout* series. Your protagonist is meant to be searching for an abducted child, but he or she will probably spend a dozen or so hours

roleplaying a superhero or saving semi-sentient robots before they'll get a move on. The problem is, with the series' first voiced protagonist, it appears Bethesda actually wants you to invest in this plot, to the extent that it removes some of the roleplaying strengths of previous instalments. Conversation trees, for instance, are stifling in their lack of options to play a villain.

Still, freedom is found elsewhere, and the game's finale can be experienced in several ways depending on which wasteland faction you build an affinity with. It's an ending we've come to expect from Bethesda games — the type that encourages another runthrough — and that's likely to be attractive to most. As always, Bethesda makes an apocalyptic wasteland a place you actually want to live in.

[ SHAUN PRESCOTT ]







## Star Wars: Battlefront

THE FORCE AWAKENS, BUT LACK OF LONGEVITY IS ITS PHANTOM MENACE.

From \$64 | PS4, X0, PC | [starwars.ea.com/starwars/battlefront](http://starwars.ea.com/starwars/battlefront)

FOR THE MOST part, *Star Wars: Battlefront* precisely mirrors the original film trilogy, from the look and feel of key locations, such as Endor and Hoth, right down to minute details like the cockpit of an X-Wing or the noise an E-11 blaster makes when you fire it in the direction of some Rebel scum.

For some, the game's universal accessibility will be a personal insult, as they long for the complexity and depth offered by other shooters. However, it's not designed to compete with *Battlefield*, *Call of Duty*, *Destiny* or any other FPS you care to name — it's to have a simple kind of fun with fellow *Star Wars* fans. There's little incentive to play *Battlefront* on your own, and if that's the experience you crave, then this isn't the game for you.

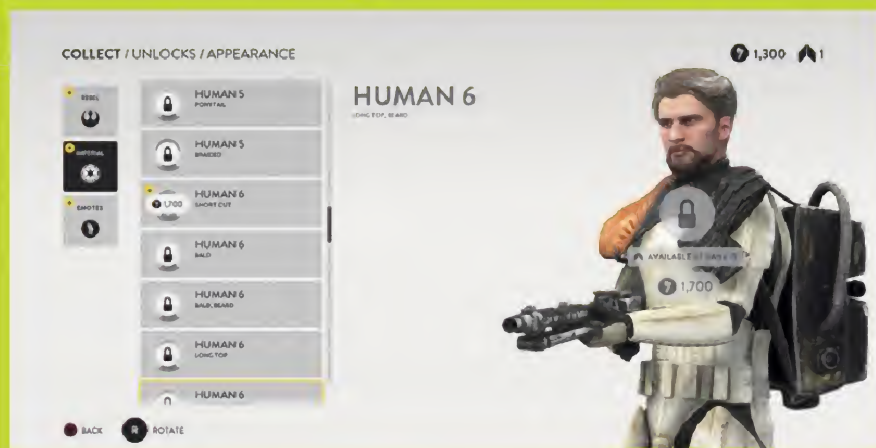
*Battlefront* is a multiplayer experience, pure and simple. You can tread solo into modes like Training Missions, Battles, Hero Battles and Survival, but they're all available to play with another person and each is the better for it. This isn't an FPS where a skilled trigger finger matters too much. It's all about running

around, blasting anything that moves, dying and quickly respawning.

But the presentation isn't perfect. Some of the hero characters are poorly voiced, especially Vader (a huge oversight), and playing as Boba Fett and Leia doesn't feel all that special. Even Luke and Vader's lightsaber-swinging isn't as satisfying or precise as you'd want it to be. Generally speaking, the heroes and villains are, surprisingly, a low point in an otherwise flawlessly authentic *Star Wars* experience.

There's plenty to love here, and the first time you step into the forest of Endor, blast a Stormtrooper, and watch a speeder bike whizz past, you'll be in cinematic nirvana. Yet, if you're looking for complexity and longevity, DICE's insistence on keeping things simple will leave you high and dry within about 10 hours. Maybe less. However long you persist with *Star Wars Battlefront*, though, there's little doubt that you'll enjoy almost every blaster-firing, Ewok-chasing, thermal-detonator-holding second.

[ ANDY HARTUP ]



DISCOVER  
GAME REVIEWS



## RISE OF THE TOMB RAIDER

SUPERB SIBERIAN SEQUEL UNEARTHS THE SPIRIT OF A TRUE LEGEND.

*Rise Of The Tomb Raider* ditches its predecessor's fictional Japanese island of Yamatai, and instead transports Lara to Siberia to hunt down the Divine Source — a legendary artefact that eluded her father for years before eventually driving him to suicide. Sadly, while mechanically strong, *Rise*'s story and pacing never sweeps you away like *Uncharted* at its best.

The addition of deadly predators such as lynx, snow leopards and grizzlies certainly gives *Rise*'s sandbox side activities more teeth. Like its predecessor, this action-orientated sequel channels open-world elements. Lara's frigid playground is basically one big interconnected hub, where linear corridors designed for showy set pieces join up with little sandboxes. New gadgets like the grapple axe and climbable broad-head arrows make Croft more dexterous than ever. It's also impossible not to be bowled over by how pretty everything looks.

There are also challenge tombs, which are fantastic. Not only do they place more focus on subtly evolved, pleasing platform bits, they're gently taxing in a way that almost always gets your grey matter going without ever leaving you baffled or frustrated.

[ DAVE MEIKLEHAM ]

From \$65 | X0, 360; PC and PS4 coming in 2016  
[www.tombraider.com](http://www.tombraider.com)



## GUITAR HERO LIVE

A ROCKIN' MAKEOVER WITH SIX APPEAL.

The classic series has returned after being MIA for five years and the familiar five buttons have been replaced with two rows — three black frets and three white frets.

The Guitar Hero Live mode casts you as the guitarist in a number of faux bands as you perform at festivals. This is presented through a first-person viewpoint using real video footage. Play well and your fans will cheer you on, but start messing up and you'll receive a harsh booing. We genuinely had a flutter of stage fright while playing the larger shows. In Guitar Hero TV mode, there are several channels streaming tracks and, at any point, you can jump in and start playing whatever song is on.

However, the soundtrack feels weak compared to previous titles. There are some decent rock songs to uncover, but strumming along to Eminem and Skrillex feels like a waste of time. You can buy a Party Pass that unlocks the entire *Guitar Hero Live* catalogue for 24 hours, but the inability to just purchase your favourite tracks for unlimited play is a serious disappointment.

[ IAIN WILSON ]

\$119 | PS4, XO, Wii U, PS3, 360, Mobile  
www.guitarhero.com/au/en



## Call of Duty: Black Ops III

OPERATION: CRAM ENOUGH STUFF ON A BLU-RAY TO MAKE YOUR CONSOLE CREAK.

PS4, XO, PC, PS3, 360 | From \$69 | www.callofduty.com/au/en/blackops3



IN BLACK OPS III, Treyarch is packing the modes with more than ever before. Multiplayer is stuffed with the modes and loadout systems that come with any *COD* instalment, but augmented with fresh ideas. Alongside weaponry, perks, equipment and kill streaks, you now choose from a lineup of nine unlockable characters, the Specialists, each of whom brings one of two unique abilities into battle with them.

It feels comfortably familiar to play — nabbing *Advanced Warfare*'s double-jumps and parkour, yet dropping lateral thrusters — but the changes add a sheen of freshness to proceedings. It's about helping you have more fun, which was likely the mantra for those making the campaign too. Sadly, they had far less success.

The outlook is initially good — telling the story of a nameless soldier (for the first time, you get to select gender and some measure of your appearance) who's mutilated by robots in the now-dystopian universe of the *Black Ops* timeline, it delves into more heady territory than most *CODs* have dared to tread. After

being rebuilt Robocop-style, you start uncovering a conspiracy that's seemingly using brain implants to turn good soldiers into killing machines for unknown ends. It's dark, even trippy in places, and you can feel the ambition to tell a story about more than simple warfare.

Unfortunately, none of that ambition quite comes off. The storyline is close to a disaster, told badly, with horrible exposition that can't cover for the whole chunks of narrative simply missing, while the same boss fights play out over and again.

Zombies mode has been beefed up — and, if anything, it's the better storyline on offer. Now taking place in a film noir setting, this is classic fare with a brilliant, gaudy veneer.

More than anything else, it's Treyarch's devotion to making the game feel expansive and welcoming that makes *Black Ops III* work. *Call Of Duty* is known for setting a standard, and this lives up to that heritage. You won't find a more feature-stuffed shooter this year.

[ JOE SKREBELS ]







## Assassin's Creed: Syndicate

UBISOFT REDEEMS ITS TROUBLED FLAGSHIP SERIES WITH A LONDON JAUNT.

From \$79.95 | PC, PS4, Xbox One | [www.assassinscreed.com](http://www.assassinscreed.com)

3½

ASSASSIN'S CREED: SYNDICATE, the ninth major game in the series since 2007, seemed destined to fail. Last year's instalment was a dog's breakfast, and series fatigue dominated the conversation in the lead up to its release. So it comes as a surprise that *Syndicate* is a decent (albeit conventional) *Assassin's Creed* game that doesn't stray too far from the back-to-basics template last-year's *Unity* established.

It's not just the fact that it's reasonably stable compared to its buggy predecessor: the writing is much improved, with dual protagonists Jacob and Evie Frye proving charismatic enough to obscure the fact we've been playing this game for eight years straight. New systems like the grappling hook make traversing London's wider streets a lot smoother and enjoyable, and while the series' often frustrating parkour mechanics aren't entirely fixed, they've definitely been iterated on.

1800s London is beautifully rendered and it's a pleasure to explore, but it's the historical cameos that delight the most: you'll bump into

Dickens, carry out sordid tasks for Darwin, and explore long-dismantled areas of the British capital. Split into neighbourhoods, the Frye twins are tasked with toppling the dominant criminal gang in each, and this is achieved via the usual means: stealth, hand-to-hand combat and light investigation quests. Most refreshingly, you can smash through the dusty streets on the back of horse-drawn carts, which is surprisingly much more fun and brutal than it sounds. Much like the naval combat in *Black Flag*, horse-and-cart pursuits don't sound like they'd work well in video games, but they're streamlined and fast enough to be very effective here.

Is *Assassin's Creed: Syndicate* a return to form? Well, it's certainly incapable of surprising in 2015, but if you're after a workman-like action-stealth adventure, there's plenty to recommend about it. We'd really like to see Ubisoft take a year off and create a truly new *Assassin's Creed* that shakes up the established format a bit, but in the meantime, this is a substantial and exciting adventure.

[SHAUN PRESCOTT]



WINNER  
**TECHlife**  
ED'S CHOICE  
AWARD



## MINECRAFT: STORY MODE - EPISODE 1

A CHIP OFF THE OLD BLOCK.

The last few years have seen the point-and-click episodic specialist Telltale dishing out narrative games fast and hard. This latest release, however, is a bold departure for the studio. *Minecraft: Story Mode* marks the first time Telltale has created a narrative for an IP that... well, doesn't have one to start with.

Luckily, what the franchise does have is a rich wellspring of creatures, locations and ideas just begging to be, ahem, mined. Fans of the original game will be delighted by trips through the Nether, in-jokes about Creepers and the ability to craft items and build structures, and even those who aren't into *Minecraft* can enjoy the witty dialogue, the gorgeous graphics and the hilarious facial expressions of your trusty sidekick pig, Reuben. The story is fleshed out with characters that are genuinely strong and complicated in their own right.

Still, your decisions never really feel like they matter, and in a game sold on its freedom of choice, it's hard for that not to be a downer.

[ALYSIA JUDGE]

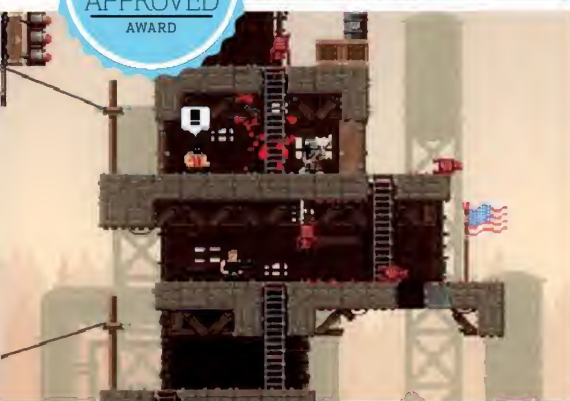
From \$6.54 | PS4, XO, PC, PS3, 360, PS Vita, Mobile (Wii U coming soon)  
[www.telltalegames.com](http://www.telltalegames.com)

4½





WINNER  
**TECHlife**  
APPROVED  
AWARD



### BROFORCE

GET MISSION, KILL BAD GUYS, RESCUE GOOD GUYS, KILL BIG BAD BUY, ESCAPE ON HELICOPTER INTO SUNSET.

The archetypal action movie plot is so mechanical that developer Free Lives has turned it into an actual game mechanic. It's how every single level of *Broforce*'s technically endless campaign plays out.

There's no choice as to who you play — you're randomly assigned a Bro at the start of a stage. Rescuing a caged POW wins you an extra life but randomises you again. It's a lovely system, making you weigh the benefits of a good character against staying alive longer but getting a crap one. Everyone wants to be Leon, who can have tiny Natalie Portman snipe swathes of enemies, but no one wants to be McGyver, who weedily throws big turkeys with TNT stuffing. The more POWs you rescue, the more Bros you're able to turn into.

It's certainly a spectacle — with the right four characters, the entire screen can disappear in seconds — but actually playing becomes a sterner test. It's incredibly easy to lose track of your character, so you don't notice you're collapsing a bridge on your friends' heads, ruining the game for everyone.

[ JOE SKREBELS ]

\$14.95 | PC  
www.broforcegame.com



## Need for Speed

THE LONG-RUNNING RACER TAKES A WRONG TURN.

\$69 | PS4, XO, PC | www.needforspeed.com

3

GHOST GAMES' FRANCHISE reboot represents a fresh start for a series that has been tweaked, modified, occasionally dented and pulled violently in as many different directions as the cars at its core. This latest game attempts to pull together the best elements from many of the entries that preceded it, but the main focus is on rekindling those magical *Underground* days, and celebrating street car culture.

On that front, it's succeeded, but at a cost. The Swedish studio was also responsible for the ambitious but flawed *Need For Speed: Rivals* — an open-world, online looker that riffed on Criterion's *Hot Pursuit* entries and introduced a brilliant risk/reward mechanic tied to cop baiting, but also continued a trend that saw the series shifting ever further from where fans wanted it to be. As a result, *NFS* has been stripped back drastically, in favour of something a little grubbier.

One thing it does share with that first game, however, is its innovative use of FMV. Races revolve around the not-quite-complicated lives and relationships of five stereotypical street racers, all played by real actors in cutscenes

that blend CG sets and cars with live action footage. It's a clever effect that adds a layer of Hollywood sheen to the game, and sets up a passable narrative. Each of the characters represents a different focus (speed, style, build, crew and outlaw), and completing events and challenges they individually set raises your reputation in that discipline.

Distressingly, taking part in these events isn't as enjoyable as watching the cast ham it up on screen. Vehicle handling is highly adjustable via a cleverly presented tuning system, which manages to be both in-depth and uncomplicated. But no matter where you settle on the sliding scale between drift happy and corner hugging, cars come across as aloof and uncharismatic. Driving rarely feels organic, instead labouring under the weight of some rather prescribed physics and one of the least satisfying handbrakes we've ever yanked on.

This brash game is by no means entirely devoid of charm, but it's an underwhelming start to *Need For Speed*'s bold new future.

[ BEN MAXWELL ]

4





[ SPECIAL OFFER ]

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# Bajo's gaming year in review

2015 WASN'T AN ORDINARY YEAR FOR GAMES. IN FACT, I DON'T THINK WE'VE HAD SUCH A BIG, INNOVATIVE YEAR LIKE THIS SINCE 2011.

[STEPHEN 'BAJO' O'DONNELL]

DO YOU REMEMBER 2011? I know it wasn't that long ago, but it's important to look back now and then to gain perspective on just how quickly games can change and reinvent themselves. That's why I love games so much. They're always changing. Always improving. Always making leaps and bounds that no-one saw coming.

In 2011, we made hundreds of daggers in *Skyrim*; there was the destructive vehicular combat of *Battlefield 3*; a DC fan's dream was fulfilled with a true open-world Batman experience in *Arkham City*; co-operative puzzling delight with *Portal 2*; multiple paths of augmented sci-fi with *Deus Ex: Human Revolution*; the most realistic facial motion capture (still is!) with *LA Noire*; epic adventure with *Uncharted 3*; a reinvention of *Mortal Kombat*; a genre broke new ground and destroyed lives with *Dark Souls*; a *Star Wars* MMO with *The Old Republic*; one of the most beautiful RPGs ever made with the *Witcher 2*; platformers reinvigorated with *Rayman Origins*, as well as *LittleBigPlanet 2*, *Forza 4*, *Terraria*, *Dead Space 2*, *Bastion*, *The Legend of Zelda Skyward Sword*, *COD: Modern Warfare 3*... I have to stop or I'm going to pass out. 2011 was the peak of last generation. Developers had been working with the current hardware for around six years, and were putting out hit after hit.

This new gene of hardware has only been around for two years. *Two!* And we're already seeing games of staggering size and scope. Perhaps developers had a headstart this time around, because the hardware leap wasn't so great. There was a jump from standard definition to high definition, but that's not to say that the last generation's change was easy!

It's very difficult for both developers and publishers who have to deal with high expectations, and split revenue between old and new console owners. But it's equally exciting to think about what is in stores today, as it is to think of what games we will see when we hit that six-year mark again in a few years' time.

So what did we see this year? Slightly better sexual diversity was a focus for many developers. *Assassin's Creed Syndicate* is a great example of this, weaving two stories with both a male and female playable character as the main protagonists. It's my favourite *Assassins Creed* game, for this reason and a stack of others. The combat is finally fun. I never tired of those scrappy fights in downtown London. And with the addition of a zipline to skip past some of the

more tedious climbing puzzles, it's quite an accomplishment for a series this old and exhausted to be this fun again.

We also saw worlds get so much bigger. *Rise of the Tomb Raider* perfectly combines wide open space with a strong, driven storyline. It's a hard balance and they absolutely nailed it. You never feel like you have to explore every corner of the map, but you can if you like. Either way, it's not a 'shopping list' game to extend gameplay. It's also one of the most cinematic games of the year, especially the way they've handled motion capture and camera control during gameplay. It's the sort of thing you don't notice, unless you look for it. Plus, Lara's hair...! Wow... fabulous. Such physics!

Of course, it was a big year for *Star Wars* too! *Battlefront* was simple pew-pew fun,







Nice to see a big game live up to the hype! *Fallout 4* is incredible, and the more you play, the more you learn why.



I played through all three major *Old Republic* expansions in just in a few sittings, thanks to a new streamlined quest system. Also, check out my pirate hat.

pure fan service, and one of the most true-to-life Star Wars games ever made. But it was *The Old Republic's* expansion, *Knights of the Fallen Empire* that really sucked me in. In a weird move, developer BioWare pulled out most of the massively multiplayer elements for this expansion, and focused on telling a strong, *KOTOR*-like single-player story, with vastly improved choice/consequence mechanics. I challenge you to watch the opening cinematic online, and not immediately resubscribe to this somewhat aging, but still enjoyable MMO.

I was surprised by what *Batman: Arkham Knight* did with its story. It told the most interesting and mind-blowing narrative of the year, maybe only rivalled by the unique tale of *The Beginner's Guide*. I won't go into details, because it'll spoil



It's such a shame *Arkham Knight's* release was tainted by a game-breaking, bug-filled PC version. Hopefully, that's all fixed now, because it's amazing.

things, but if you're interested in what games are doing right now with narrative, or even if you're only a passing Batman fan, you need to play *Arkham Knight*.

My favourite indie game was absolutely *Reign of Kings*, with Victor Vran running a close second. What can I say about *Reign of Kings*...? You can run around with a rock up your butt, building castles, and taxing other players in the land from a throne on

THIS NEW GENE OF  
HARDWARE HAS ONLY BEEN  
AROUND FOR TWO YEARS.  
TWO! AND WE'RE ALREADY  
SEEING GAMES OF  
STAGGERING SIZE AND SCOPE.

to none.

Speaking of house-building, *Fallout 4* has it in spades, and is absolutely my game of the year. A tough choice, as there are so many game of the years, but I love this series and its world full of secrets, mysteries and humour. The writing is incredible, the action is rich and evolved, and the world is big and dense. It makes getting distracted fun and rewarding. Well done to Bethesda, and now we shall feast on the plethora of mods out there.

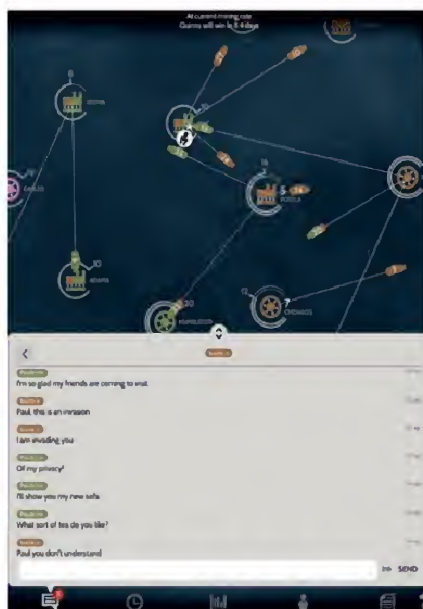
There were so many other standouts. *LEGO Jurassic Park World* allowed us to relive those first few movies in such a fun and delightful way. *Rocket League* (soccer with cars) is perfect, and possibly the greatest game of all time. *Mortal Kombat X* was excellent, *Mad Max* took on the difficult task of car combat and mostly nailed it. And the *Witcher 3* set a bar for visuals and scale so high, that every other RPG developer weeps in its wake.

Now, onwards to 2016! ■



It's incredible that this *Tomb Raider* sequel came out so soon, and is longer and still perfect.

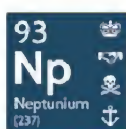




[MOBILE GAMES]

# Sea sneaks

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[IOS &amp; ANDROID]

## SUBTERFUGE

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SUBTERFUGE IS A tactical game that isn't about tactics, weight of numbers or economics. It's really about deception in all its forms — misinformation, misdirection, misrepresentation and outright lying. No, really, it is.

A multiplayer game set in a steampunk-style underwater world, *Subterfuge* has players competing to mine precious Neptunium. Everyone begins with a small collection of bases and factories, the start of an economy that builds more of the game's main units, known as drillers. Drillers are dispatched to conquer enemy facilities, inching towards them as the hours tick by, defeating each other at a one-to-one ratio.

In most cases, weight of numbers will decide who wins a battle, but it's important to hold drillers back to build more mines. Every new mine is a greater investment of drillers. This makes all-out war unsustainable. While factories gradually manufacture new drillers with agonising slowness, *Subterfuge* demands you focus on negotiation and pick your battles. It wants you to form alliances, divide and conquer, betray and backstab.

Unfortunately, there are no mechanics around this — it's all down to text chat. While you can gradually recruit specialist

units whose powers can swing a battle, *Subterfuge*'s diplomacy is solely about words. You can't intercept or disrupt communications, for example. While some players will be content to rely on constant, bald persuasion, it's a shame there isn't a way to manipulate this core aspect.

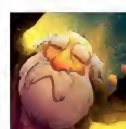
*Subterfuge* is also very drawn-out. Drillers take hours to reach destinations and factories aren't quick to replenish them. There's loads of time for negotiation and, sometimes, the game is simply discussion. Thankfully, an innovative interface allows you to scroll forward in time and not only foresee outcomes, but also schedule orders in advance.

Not everyone will have the stamina for games that run for well over a week, nor a taste for so much talk and for a great deal of success riding on pure persuasiveness. Really, *Subterfuge* is one for the Machiavellian. Or salespeople.

*Subterfuge* does intrigue fairly well, but it won't be for everyone.

[PAUL DEAN]

3



[IOS]

## THE BEGGAR'S RIDE

A BEGGAR-TURNED-GOD GOES ON A JOURNEY.

\$5.99 | [www.thumbstar.com](http://www.thumbstar.com)

Named for the proverb "If wishes were horses, beggars would ride", *The Beggar's Ride* is a 2D platformer that asks what would happen if a beggar had the powers of a god.

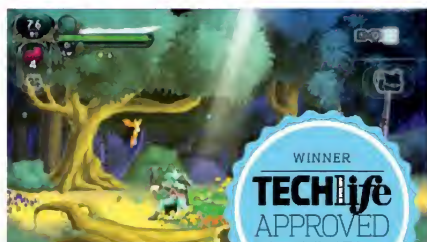
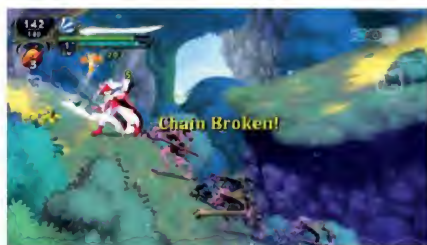
In a colourful crystalline world, the beggar collects masks that give him the ability to alter that world to help him solve puzzles to progress: summon rain to turn wheels or fill pools, create an earthquake to send objects sliding, and more. Sometimes, the puzzles require trial and error, so thank the (beggar) gods for the reset button.

Each ability is controlled with an intuitive gesture, such as dragging clouds together or using two fingers to rotate the screen. Generally, the platforming is slow-paced, exploration is encouraged by collectables, and regular checkpoints mean death is rarely frustrating. The game unfolds at a leisurely pace, telling the beggar's story in snippets of prose that appear placed prettily around objects in the environment. Though that story is more style than substance, the game still stands out.

[JORDAN ERICA WEBBER]

3½

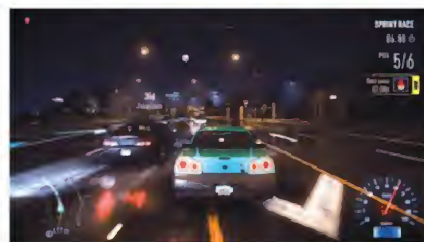




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Armed with magical weapon Ahrah and its floating fox-like guardian Fidget, our hero Dust has to figure out who he is, what's going on and why monsters are terrorising the land.

Although there is some exploration involved, what this largely boils down to is smashing things so that damage numbers pop out of their heads and they eventually disintegrate. Combat is a hacking, slashing affair with a focus on combos. Fidget also comes in useful, with a simple projectile attack that can be combined with your own Dust Storm ability to lay the pain on multiple foes at once.

Levelling up adds a slight role-playing dimension, since you can shape Dust's abilities with 'spirit gems', putting them into the specific areas where you feel he's lacking.

The controls aren't always as responsive as we'd like for a game that ostensibly rewards combat precision and the inventory seems like it would be better navigated with a pad, as in the console original.

This 2D action game is occasionally spammy, but it's certainly a looker.

[ EMMA DAVIES ]

It's pretty difficult to talk about AZZL without referencing *Dumb Ways to Die*, another cute animated puzzle game that was released as part of a campaign to stop idiots playing on train tracks. They share an art style — blobs of varying size with stick arms — and both involve the blobs doing stupid stuff. The main difference is that AZZL doesn't usually have the blobs being killed in various amusing ways.

AZZL offers a bunch of short puzzles, beginning with simple sliding puzzles and progressing to more difficult ones involving rotation and different tessellating shapes.

But even with its bright colours and simple, humorous animation, is this a game for children? Some of the puzzles are far too tricky for young minds, but the short time it takes to complete each one makes it a bit sparse for adults. It could have done with being either simpler for children, or more taxing for adults, but as it is, it sits slightly uncomfortably in the middle.

In the end, *Dumb Ways to Die* is better... and free.

[ KATE GRAY ]

*Need for Speed: No Limits* offers a decent amount of gameplay for its non-existent price. The game's main campaign is powered by 'fuel points'. Entering a race costs fuel, and your tank is refilled when you level up. Running on empty? You'll get a top-up after a spell in the pits, or by buying more with gold bars, which are available in exchange for actual money.

The game looks stunning, and boosting, drifting and darting past other cars all feel great. But then the frustrations set in.

Those nitro boosts and drifts, along with basic left/right steering, are your only controls. You're in the racing game equivalent of an endless runner. There are various types of events on offer — races, time trials and so on — but they don't require any real shakeups in terms of strategy.

*No Limits* requires a constant internet connection. No data/Wi-Fi? No keys for your ignition. It seems thoroughly at odds with the game's structure, and perhaps makes for one limit too many in the end.

[ EMMA DAVIES ]



## TEST BENCH

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[ MAY THE SCHWARTZ BE WITH YOU ]

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## HP Star Wars Special Edition Notebook

"MERCHANDISING, MERCHANDISING, WHERE THE REAL MONEY FROM THE MOVIE IS MADE."

THERE'S A FANTASTIC scene in Mel Brooks' *Star Wars*-lampooning 1987 flick *Spaceballs*, where the Yoda-like character (Yogurt, played by Brooks himself) breaks the fourth wall and espouses how important merchandising is in today's Hollywood movie-making machine. "*Spaceballs* the T-shirt, *Spaceballs* the Coloring Book, *Spaceballs* the Lunch Box, *Spaceballs* the Breakfast Cereal, *Spaceballs* the Flame Thrower!" he enthuses, picking up the latter and giving it a quick blast.

It's no real surprise, then, that with the hotly-anticipated seventh *Star Wars* flick *The Force Awakens* now in cinemas, there's been an absolute flood of product tie-ins to go along with it. Thus we have this HP-made unit: *Star Wars* — the Laptop. Now, co-branding has a somewhat dubious history in tech — more recent examples include a Pepsi phone that's available in China, but in the past, we've also had *Transformers* shaving kits and a *Matrix Reloaded* phone.

So what exactly makes a *Star Wars* laptop? In this case, it's a chassis that's lavishly adorned with Dark Side imagery — Vader on

the lid, a storm trooper on the right of the keyboard deck and the Death Star on the left. The trackpad has the targeting grid from Luke's Death Star trench-run silkscreened onto it, and the keyboard's black keys glow red when the backlight is switched on. It's reasonably tasteful as far as conspicuous branding goes, and when you fire the unit up, you'll find a host of *Star Wars* galleries to peruse (which largely focuses on the original 70s and 80s flicks and almost completely ignores the prequel trilogy — something we can definitely appreciate), a comic book and a smattering of other digital books and pamphlets. There's almost nothing to tie-in with the new flick, barring a handful of images that don't give anything away that wasn't shown in trailers.

It's not a bad haul, but there's nothing particularly must-have here — it would've been nice to see something a bit meatier: the digital copies of the movies perhaps, or a complete collection of *Star Wars* games. As it is, we can't see anyone but *Star Wars* superfans actually wanting to buy one.

Which is kind of a shame, because performance-wise, this one's not all that bad. Now, it's not exactly "the fastest hunk of junk in the galaxy", but the 15.6-inch display, Core i5-6200U processor and 8GB of DDR3-1600 memory on offer are respectable, and joined by an Nvidia GeForce 940M, it's capable of a bit of gaming too — albeit at low detail settings. There's only a DVD drive, so you won't be watching the flicks on high-def Blu-ray, but that's par for the course at this price. For us, the only real letdown is the 1TB 5400rpm hard drive; there's no sign of an SSD, which makes tooling around in Windows 10 Home a little sluggish at times.

If you can ignore all the branding though, this is a half-respectable notebook in terms of value. The \$1,300 price is right for the specs on offer — the only machine close to this configuration is HP's own ProBook 450, which has a slightly slower AMD Radeon R7 340M graphics processor. We guess that means this is an endorsement. *Star Wars* superfans, consider that an invitation to open your wallets.

[ DAN GARDINER ]



GENERAL PERFORMANCE	GENERAL PERFORMANCE	GAMING PERFORMANCE	BATTERY LIFE
PCMARK 8 - HOME (TOTAL SCORE)	CINEBENCH R15 OPENGL (FPS)	CINEBENCH R15 CPU (MULTI-THREADED)	PCMARK 8 - HOME (HR:MIN)
2,396	23.2	126	4H 06M
COMPARED TO MICROSOFT SURFACE PRO 4			
2,873	36.85	306	3H 48M



## HP STAR WARS LAPTOP

\$1,299  
www.hp.com/au

## CRITICAL SPECS

Windows 10 Home (64-bit), 15.6-inch LCD screen @ 1080p, Intel Core i5-6200U CPU, 8GB RAM, 1TB 5400rpm hard drive, DVD-RW drive, Gigabit Ethernet, 802.11ac Wi-Fi, HDMI out, two USB 3.0, one USB 2.0, 2.21kg.





## D-Link DSL-4320L

IT'S GOT THE SPEEDS, BUT IT'S A BIT SHORT ON SMARTS.

IF YOU LIKE 'em loud and proud, D-Link has just the router for you. The DSL-4320L (AKA the Taipan) is the ADSL-equipped version of the D-Link's older DIR-890L router, a model which was launched early in 2015. With six antennas apiece and glossy racecar paint jobs, both look essentially identical: this model just comes in bright-blue, rather than the DIR-890L's red. Both are equally massive devices that, at a glance, look more like souped-up quadcopter drones than the stationary pieces of networking gear they actually are. (We're pretty sure the flashy paint jobs don't make them go any faster.)

For now, the Taipan is an ANZ exclusive, and it's what vendors have been calling 'tri-band' routers, meaning they have three wireless radios inside. That's a single 2.4GHz 802.11n-capable radio (supporting speeds up to 600Mbps) and two 802.11ac 5GHz ones (at up to 1300Mbps a pop), with one of the latter also offering MU-MIMO support. This is the first tri-band

router with an ADSL modem built in — thus, the slightly high asking price.

If all that's a bit confusing, the good news is that you don't need to know all that much about what's under the hood to benefit from all that tech: the Taipan can be set up so it only offers one Wi-Fi network for you to connect to, and based on the abilities of the device you're using (be that a smartphone, laptop, TV, games console or other), the router will intelligently connect you to the right radio.

And that MU-MIMO support means it more effectively distributes its wireless bandwidth when multiple devices are connected: without it, you'll often find one device can hog all the speed. And at close

range, the Taipan is fast. We clocked speeds of up to 70MB/s on our 867Mbps test laptop, which is basically maxing-out the latter's Wi-Fi. It didn't quite fare so well at longer ranges, where it was a little below average: around 20–25Mbps where the best can manage 30–40Mbps.

Still, hardware-wise, it ticks most of the boxes you could reasonably expect. But while the onboard software features also cover all the basics most people will need (including USB storage support and mobile apps for configuration from your phone) and are reasonably easy to use, those features often aren't as flexible or deep as you'll find elsewhere — particularly when compared to the likes of the Synology RT1900ac (see page 18).

It's in the configuration options and details that the DSL-4320L falls a bit flat. While there are parental controls, for example, but they're only rudimentary — just a website filter that you can put 24 sites into. Other brands offer cloud-based services with sophisticated blocklists based on different types of heuristic content filtering. And while the Taipan does have a scheduling feature, this only lets you turn the firewall and website filtering features on or off at specific times.

The statistics page is another example. It can give you a live view of traffic being used and the total that's been downloaded since the router was rebooted, but there's no real configurability here, or the ability to drill down and, say, track individual clients or set quotas for them, or specify when your broadband monthly quota is reset so you can keep track of your total downloads.

That lack of feature-depth may not matter to some, but for us, when you're asking a premium price — and \$580 is definitely premium — you should be able to expect the best across the board. And with its current software setup, the DSL-4320L doesn't quite deliver.

[ DAN GARDINER ]

YOU DON'T NEED TO KNOW  
ALL THAT MUCH ABOUT  
WHAT'S UNDER THE HOOD  
TO BENEFIT FROM  
ALL THAT TECH.



D-LINK DSL-4320L  
\$580  
www.dlink.com.au

### CRITICAL SPECS

ADSL2+ modem, 2.4GHz 802.11b/g/n Wi-Fi (up to 600Mbps), 5GHz 802.11n/ac Wi-Fi (up to 1300Mbps) x 2 with MU-MIMO, USB 2.0 & 3.0 ports, four Gigabit Ethernet, six external antennas, hardware power button.







## TomTom Spark Cardio + Music

MOVING TO ITS OWN BEAT.

TOMTOM'S SPARK FEELS like a logical culmination of everything that has come before it. This multi-sport watch features a heart rate sensor — TomTom ditched chest straps a generation or more ago — and, of course, a GPS. New to the range is 3GB of inbuilt storage for music. Pair the Spark with a set of Bluetooth headphones and you'll find a playlist from the Ministry of Sound already included, a nice touch.

This is a watch that's not just about music, though: it prides itself on its multi-discipline nature, with tracking options for running, swimming, cycling, gym work and 'freestyle' when you simply want to monitor your heart rate. Everything here has been designed with ease of function in mind, and you'll quickly become familiar with the UI — the four-way button helps a lot.

In testing, we found the wide, double-notched strap kept the Spark secure during rough surf, and felt comfortable over a week spent swimming, cycling and running. On dry land, the watch displays your heart rate and distance thanks to the GPS, though in water, these functions (and Bluetooth) are disabled, relying instead on your stroke to determine distance and calories burned.

The GPS can be a bit slow to register a signal, and we often spent a couple of minutes impatiently waiting for the watch, even in clear skies. What's most disappointing, though, is that it's highly inaccurate in water. We went through two test units, each with the latest firmware, and both incorrectly measured our swim distance by an enormous margin.

Which is a shame, because on dry land, the Spark's a treat. A noticeable buzz alerts you to training milestones, and metrics can then be uploaded (using a proprietary USB cable) to TomTom's web service, or to your favourite sports site (like Endomondo, Strava and so on). Expect about a week out of the battery for low use, and roughly five hours with constant GPS usage. [PAUL TAYLOR]



## Olympus Air A01

A GLIMPSE OF THE FUTURE FOR PHOTOGRAPHY.

THE OLYMPUS AIR is a miniature camera, **complete with** a 16-megapixel, Micro Four Thirds sensor and a mount to attach **lenses**. Your iPhone acts as both a remote control and display. The camera measures just 2.2 x 1.7 inches, and is lighter than a jar of baby food at just 181g. While this is great for portability, there is an issue with balance when using a large lens.

The A01 is similarly light when it comes to on-board controls. Along the top, you'll find a power button and large oval shutter release. On the sides, you'll find two switches; one toward the front keeps your lens locked in place, while the rear secures the iPhone clip. The clip holds your phone at a diagonal, making it great for low- and high-angle shots. Remove the mobile device mount and you'll find a switch to turn off the device's Bluetooth and Wi-Fi in addition to the micro-USB charging port. You'll primarily use the Air through the app, and you can scan a QR code to set up a Bluetooth/Wi-Fi connection. (NFC is supported for Android devices.)

In the app, you'll see basic exposure settings, including shutter speed, ISO sensitivity and aperture. You also get autofocus, metering and burst mode. You can even go fully manual. A Genius function automatically edits photos — the app essentially takes your original photo and produces six derivations, adjusting exposure and colour levels, adding filters and cropping the image.

The Air 01 produces sharp, colourful images — at a level beyond what the iPhone can manage, but does struggle with noise and colour reproduction in lower light. There's no sensor-based image stabilisation technology either. The most annoying thing about the Air, though, is how often it drops connection with your iPhone. When this happens, the app's live view stops on a freeze frame, so you can no longer see what you're shooting or access the controls.

The bottom line is: this has all the image quality and versatility of a traditional Micro Four Thirds camera, but we'd like to see the connectivity issues sorted before recommending it.

[KEVIN LEE]



### TOMTOM SPARK CARDIO + MUSIC

\$349  
tomtom.com/en\_au

#### CRITICAL SPECS

22mm x 25mm black-and-white display, heart-rate monitor, GPS, 3GB onboard storage, Bluetooth audio support, 40m water resistance, up to three weeks battery life, 52g (including strap)



### OLYMPUS AIR A01

From US\$299  
www.olympusamerica.com

#### CRITICAL SPECS

16MP, Wi-Fi, microSD card slot, Micro Four Thirds lens mount







## Sengled Pulse

THIS SMART LIGHT BULB IS NOVELTY OVERLOAD.

IN WHAT IS as unlikely a pairing as we're likely to see in the gadget world, the Sengled Pulse combines a smart LED light bulb with a JBL multi-channel stereo wireless speaker. It's one of those solutions where you didn't realise a problem existed, but if you're a fan of minimal décor, the Sengled Pulse frees you from the tyranny of having a visible speaker system and power cord.

The irony is that while you'd be likely to buy this for the smart lighting functionality and have the speaker as a bonus, the Sengled works better for music playback than it does lighting. For starters, the settings you can tweak on the LED light bulb are minimal. It only supports the one colour, 2700k warm white, so you can only adjust the bulb's brightness and turn it on and off using the Sengled Pulse app. Since it connects via Bluetooth, there aren't any options for turning the light on or off remotely or connecting it to IFTTT, either.

The integrated speaker is surprisingly good, with a decent amount of bass and stereo separation. If you have more than one Sengled Pulse (which is the case when you buy the \$349 pack), you can set them up as left and right channels for proper stereo sound. The downside is that it makes the overall light bulb quite large, and finding a light fixture or lamp that's large enough to accommodate it can be challenging.

The Sengled Pulse is a cool idea, but you'll get much better value for money buying a LIFX Color 1000 and spending the balance on a decent Bluetooth speaker.

[ JENNETH ORANTIA ]



### SENGLED PULSE

\$349  
www.sengled.com

#### CRITICAL SPECS

600 lumens, 30W at full brightness, E26, E27 and B22 mounts, 2700k white



[ WWW.TECHLIFE.NET ]



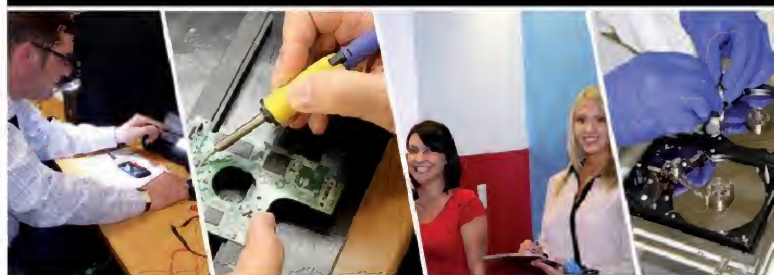
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## Motorola Moto X Play

MOTOROLA TAKES A MOSTLY-SUCCESSFUL STAB AT A 'MIDRANGE' FLAGSHIP.

THE MOTO X phones have been Motorola's flagship Androids since the company was acquired by Google back in 2012 — it's since been purchased by Lenovo — but this year, the phone-maker has taken the unusual step of releasing two different Moto X's: the higher-end Moto X Style (which we reviewed at last month) and this mid-range X Play. We weren't particularly enamoured with the Style: while it's certainly more-affordable than most (starting at \$55 per month on Vodafone) it was missing some 'modern flagship' features (like a fingerprint sensor) and its battery life was short thanks to its large 5.7-inch IPS display.

The Play turns that around somewhat, with a slightly smaller 5.5-inch screen but a much larger battery — and it's a little cheaper too — which arguably results in a much better mix. The trade-off is that the Play is not as fast as the Style in benchmarks. It uses Qualcomm's mid-range Snapdragon 615 CPU in combination with 2GB of memory, 16GB of storage and an Adreno 405 graphics chip to deliver adequate but far from award-winning

performance numbers. Not that you'd really notice in day-to-day use; with Motorola's mostly unmodified version of Android 5.1.1 as the OS, this is a slick and smooth experience when launching and using apps and even multitasking.

While the Play isn't a particularly slim or striking device, it is a reasonably handsome one — its got Motorola's traditional curved back, which means it's comfortable in the hand, and the 5.5-inch 1080p IPS display renders clean, sharp and colour-neutral images: it's great to look at. It's robust too, with the same water and dust-resistance capacity as the Style, meaning it's made to withstand accidental splashes and things like light rain (though anything more than that is asking for trouble) and the cameras are

identical on these two Moto X's: competent and confident shooters that, while not up to iPhone 6S or Galaxy S6 levels, will satisfy all but the most fussy photographers.

The other thing we loved: unlike the Style,

the Play has great battery life. Thanks to its comparatively huge 3,630mAh capacity, we often breezed through a full day with somewhere between 30% and 40% battery to spare, and it outlasted most other devices in our battery tests (reaching a fantastic 8:14 hours in PCMark

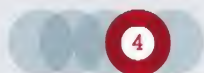
WE WEREN'T PARTICULARLY ENAMOURSED WITH THE STYLE: WHILE IT'S CERTAINLY MORE-AFFORDABLE THAN MOST IT WAS MISSING SOME 'MODERN FLAGSHIP' FEATURES (LIKE A FINGERPRINT SENSOR) AND ITS BATTERY LIFE WAS SHORT THANKS TO ITS LARGE 5.7-INCH IPS DISPLAY.

for Android, as compared to 5:11 hours for the Style), despite having an LCD that's almost excessively bright at higher levels.

Like the Style, the Play supports fast-charging (it's actually a feature of that Qualcomm SoC), but Motorola hasn't provided a charger with the phone: it's available as an optional extra for around \$40. And there's a microSD slot with support for cards up to 128GB, so if you want to cart around your media collection (or just take lots of photos) that's definitely an option.

In short, while the Play may not be the fastest phone around, it offers up a good mix of features at this price point — and it can certainly still go the distance in terms of battery life.

[ DAN GARDINER ]



### MOTOROLA MOTO X PLAY

\$569

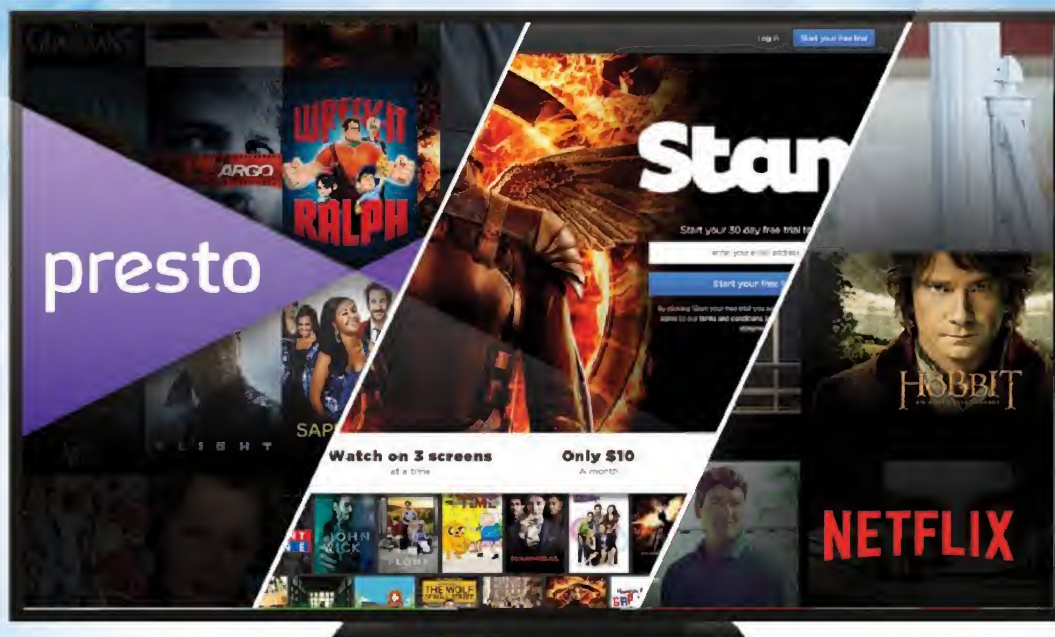
[www.motorola.com.au](http://www.motorola.com.au)

#### CRITICAL SPECS

Android 5.1.1, 5.5-inch IPS LCD touchscreen @ 1080p, octa-core 1.0 & 1.7GHz Qualcomm Snapdragon 615 CPU, Adreno 405 GPU, 2GB memory, 16GB storage, 21/5MP (rear/front) cameras, microSD slot, 169g







[ CREATE YOUR OWN ]

# STREAMING HEAVEN

**BUILD THE ULTIMATE  
AUSSIE STREAMING  
TOOLKIT & GET THE BEST  
GEAR, GADGETS & APPS!**

**50**

## HOW TO STREAM EVERYTHING

We answer (just about) all the burning questions about streaming movies and TV down under.

**70**

## NEXT-LEVEL TV RECORDERS

Today's PVRs are more feature-packed and flexible than ever, so if you're a TV nut, they're still well worth considering. We test eight of the latest.

**55**

## THE BEST AUSSIE STREAMING-MEDIA BOX

There's a heap of streaming boxes to choose from, so which offers the best overall package for Aussies?

**75**

## UPGRADE YOUR TV'S SOUND

Let's face it: the speakers inside our uber-flatscreen TVs aren't great. A soundbar can make all the difference, so this month, we've tested eight of them.

**60**

## THE BEST TVS FOR STREAMING

We discuss how televisions are changing and where they're heading.

**80**

## ULTIMATE DIY STREAMING SETUP

Plex can stream all of your movies and music across the house, and to your mobile.

**66**

## ONE REMOTE TO RULE THEM ALL

No longer just for your TV, we investigate universal remotes and their abilities around your home.



The Remix Mini is an Android-powered pocket PC that can also double as a pretty serviceable streaming device.



[ ROW, ROW, ROW YOUR BOAT ]

# How to stream everything

WANT TO KNOW (JUST ABOUT) EVERYTHING ABOUT STREAMING MOVIES AND TV DOWN UNDER? WE'VE PUT TOGETHER THIS FEATURE TO ANSWER ALL YOUR BURNING QUESTIONS.

[ JOEL BURGESS & PAUL TAYLOR ]

SO YOU BIT the bullet and signed up to one or more of the streaming services that are now available in Australia, but even though the variety of streaming devices available down under isn't as large as in the US, there are still many ways to skin the streaming cat — with some being notably better than others. With so many options and different ingredients in the streaming recipe, it can be difficult to know what you need to get the best experience. The Australian Communications and Media Authority has put together a decent info pack (at [tinyurl.com/TLA46-ACMA](http://tinyurl.com/TLA46-ACMA)) for those looking at streaming for the first time, with information on the services available, the internet speeds you need, the quality of the content on various services

and other important features of each streaming service.

## YOUR BROADBAND CONNECTION

Though ADSL2+ is theoretically capable of speeds up to 24Mbps — more than what you need for HD streaming — your distance from the exchange can cut this down drastically (we've seen it as low as 4Mbps) and, moreover, even if you do have a high sync speed, peak times make a big difference to the real world internet speeds you actually get while streaming content.

You can check your broadband connection's speed by digging into your router's settings and finding the Status page, but if you want a real-world test head to [www.speedtest.net](http://www.speedtest.net) and

run the basic test there. For the most unbiased results, make sure the device you're testing with is the only one using the Internet at the time — other users can seriously throw out the accuracy of results.

Netflix reports the average Australian ISPs download speeds at 2.5–3.5Mbps, which means that most people will be struggling to watch HD (720p) and Full HD (1080p) streams without buffering delays — to avoid the latter, you need an absolute minimum of 5Mbps — particularly at peak times.

Netflix accounts for more than one-third of total US Internet traffic at peak times — so if you think you're the only person sitting down to watch *Jessica Jones* at 7pm on a weekday, think again. Locally, 15% of Telstra's total

Broadband speed and video quality	Netflix	Stan	Presto	Quickflix
Minimum broadband speed required	0.5 Mbps	1.5 Mbps	0.5 Mbps	0.5 Mbps
Recommended broadband speed	1.5 Mbps	N/A	1.5 Mbps	1.5 Mbps
Standard definition	3.0 Mbps	2.5 Mbps	3.0 Mbps	3.0 Mbps
High definition (720p)	5.0 Mbps	3.5 Mbps	5.0 Mbps	5.0 Mbps
High definition (1,080p)	N/A	6.5 Mbps	7.5 Mbps	N/A
Ultra high definition (4k)	25 Mbps	N/A	N/A	N/A

The ACMA site tells you exactly what kind of broadband speed you'll need for streaming at different resolutions.



The Telstra TV streaming box is essentially just a localised version of the popular Roku 2 from the US.



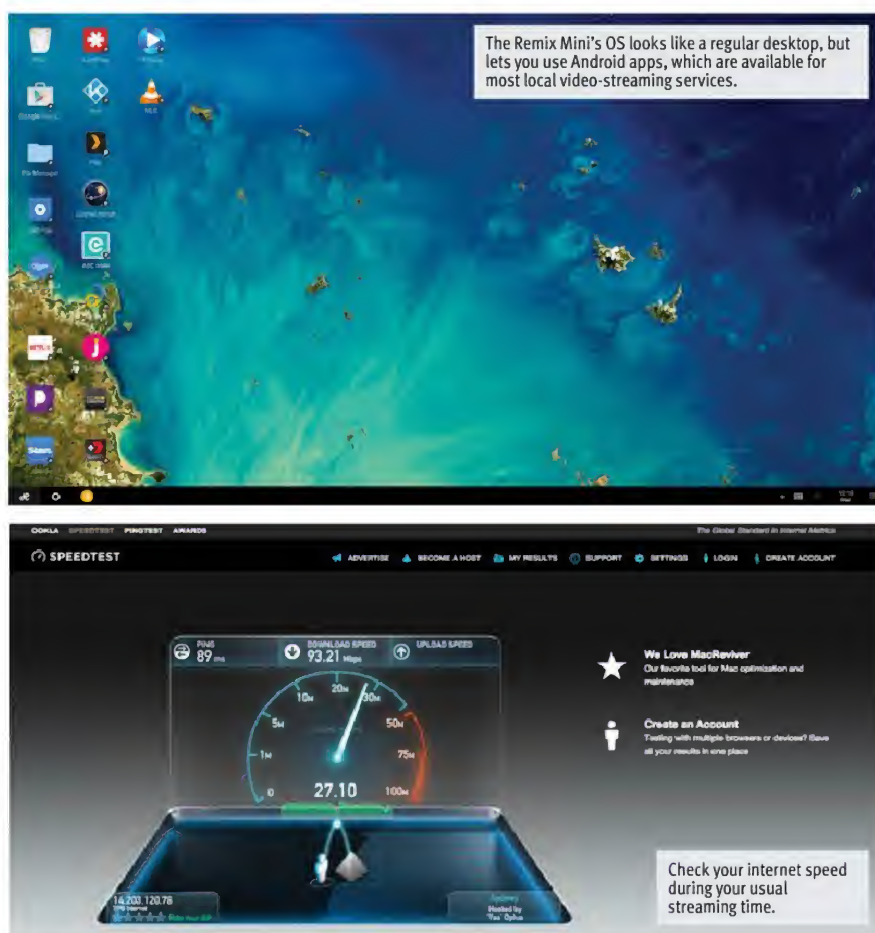
consumer traffic reportedly comes from Netflix, with another generous chunk attributable to the other video streaming services — and all that traffic on an ISP's system is going to slow down your ability to stream. So if you're serious about improving your streams, it might be worth considering signing up to cable broadband over hybrid-fibre-coaxial (HFC) that will usually deliver minimum speeds of around 30Mbps or an NBN connection, to give you that bit of leeway for peak times or even to stream more than one show at a time.

If you do decide to swap ISPs be sure to look at data caps — an average amount of monthly HD streaming will add up to over 100GB. In addition to this, if streaming is going to be your main cause of monthly downloads, then choosing an ISP with unmetered access to your favourite streaming service is worth taking note of. Unmetered Netflix is offered by Optus, TPG, iiNet and Internode, and watching Presto won't contribute to your quota if you're on one of Telstra's broadband plans. Unfortunately, streams from the Fairfax/Nine service Stan aren't unmetered on any Aussie ISP.

### STREAMING HARDWARE OPTIONS

Streaming is a slightly more complex than digital or cable TV to get on your television and though, by this point, we've had a number of streaming services for around a year now, the hardware that will help you get the services you want onto your TV is still limited. The easiest and most affordable way to get streaming services depends on the hardware you already have. If you just have an Android or iOS smartphone or a laptop, then the easiest option is probably going to be a \$50 Chromecast dongle, which you plug into your TV and cast from your smartphone app or your Chrome browser. Though for anyone serious about streaming, this isn't the ideal setup. Chromecast uses the Wi-Fi airwaves to cast media from your device to your TV, the same Wi-Fi that that is already being used to download the movie or TV show you want to watch and, though in ideal conditions, this isn't a problem, doubling up on your home Wi-Fi like this can cause far more lag, skipped frames, slow buffering and even complete crashes. A media hub that is connected to both the Internet via Ethernet and your TV via HDMI is going to streamline the process and cut out a bunch of problems that would happen otherwise.

Unfortunately, though, there is still no silver bullet when it comes to streaming media hardware; there's no Presto app on the Apple TV or the PlayStation and Xbox games consoles, and the only other reputable media player that is easily available in Australia is the Telstra TV (which still lacked ABC iView at the time of writing). Telstra partnered with Roku



— one of the big US players in the media streaming hardware space — to introduce the Telstra TV in November. Telstra's self-branded piece of hardware is essentially a Roku 3 (Model: 4200) modified for the Australian market and because Telstra is responsible for all the app development and software upkeep, some of the local free-to-air catch-up TV services are not yet available. Though it is currently the only device capable of streaming Presto, Stan and Netflix directly to the TV through an HDMI cable, Telstra makes it a little difficult for non-Telstra customers to buy by requiring you to have a Telstra ID in order to use it. Then again, you can easily register for a Telstra ID for free using your email...

As we'll discuss in a bit more depth later, the PlayStation 4 and Xbox One games

consoles double as great media players with Netflix, Stan apps (PS only at present) and other lesser-known streaming apps like the anime hub Crunchy Roll or the \$6.99 Mubi movie collection, but they're too expensive to buy for streaming purposes alone.

For people with a bit more of a hacker mentality, the Raspberry Pi 2 with RaspBMC OS ([buyraspberrypi.com.au](http://buyraspberrypi.com.au)) and the new Android based Remix Mini ([jide.com/en/mini](http://jide.com/en/mini)) are great sub-\$100 options if you're okay with a slightly more DIY solution and which you drive via a mouse and keyboard (or for a more couch-friendly option, a wireless keyboard with a built-in trackpad). For other media-streaming options and more details on many of those we've touched on above, see our full round-up on page 55.

### ISP LEADERBOARD - OCTOBER 2015

RANK	ISP	SPEED Mbps	PREVIOUS Mbps	RANK CHANGE	TYPE
1	Optus	3.50	3.41		Fixed, Cable, DSL, Satellite, Wireless
2	TPG	3.45	3.40		Fixed, Cable, DSL, Satellite, Wireless
3	iiNet	3.42	3.38		Fixed, Cable, DSL, Satellite, Wireless
4	Exetel	3.11	2.98	+1	Fixed, Cable, DSL, Satellite, Wireless
5	Dodo/Primus	3.07	3.00	-1	Fixed, Cable, DSL, Satellite, Wireless
6	Telstra	2.83	2.69		Fixed, Cable, DSL, Satellite, Wireless



Netflix's Aussie ISP speed rankings.



# House of Cards

★★★★★ 2013-2015 MA15+ 3 Seasons 5.1

A ruthless politician will stop at nothing to conquer Washington, D.C., in this Emmy and Golden Globe-winning political drama.



Based on your interest in:  
Marco Polo



## Popular on Netflix



[ REACHING FOR THE TOP SHELF ]

# 4K video streaming

HOW TO FIND CONTENT FOR YOUR 4K-CAPABLE TV.

4K TVs (also known as Ultra HD or UHD sets) have come down in price since the first 84-inch models from Sony, LG and Samsung landed a few years ago, which would've set you back around \$30,000 apiece at the time. You can now pick up a decent 55-inch Ultra HD, 3,840 x 2,160-pixel TV for around the \$1,500–\$2,000 mark if you shop around a bit. UHD has slightly less pixel density than your local cinema's 4,096 x 2,160-pixel projector, but has for all intents and purposes become the 4K standard for home cinema.

The next trick for 4K is finding content. Though Europe developed a standard for delivering 4K content through traditional TV methods, Digital TV in 4K is still some way off. The biggest legal library of 4K content that is readily available in Australia is Netflix, both Amazon's and Netflix's digital lockers of 4K content were cracked by hackers in December and so you can get a bunch of content through various online piracy avenues.

If your TV doesn't have Netflix and/or YouTube apps, you can also purchase a 4K upscaling Blu-ray player that will work with any Blu-ray disc and upscale it to UHD. Sony's \$200 BDP-S6500 4K upscaler ([tinyurl.com/TLA46-Sony](http://tinyurl.com/TLA46-Sony)) also works as a streaming hub with Netflix and YouTube apps included.

Although the Blu-ray Disk Association announced the specs for new Ultra HD Blu-ray disks in the middle of the year and we started seeing Ultra HD Blu-ray disc players hitting shelves in the lead up to Christmas, the new 3,840 x 2,160-pixel resolution discs missed out on being included in 2015 stockings. Sony Pictures announced that its Ultra HD Blu-rays will go on sale early in 2016,

so we will have to wait a little longer for the high dynamic range video and new immersive audio formats.

## YOUTUBE

Searching 4K in YouTube will bring up a decent amount of content in your browser, the only caveat with this is that you may have to manually change the default settings through the cog icon at the bottom of the video to the 2160p 4K resolution. You can test this on your laptop — if you don't mind burning through a bit of broadband data — even if you don't have a 4K monitor. Most of the content available is movie trailers, music videos and occasional artistic scenes or mini documentaries, but the search for 4K brought up about 48,000 results at the time of writing, so there is a bit of content to test the parameters of the TV.

## NETFLIX

This is really the main player when it comes to 4K content. Netflix shoots all of its in-house shows in 4K file formats and make this content available to the public on its \$14.95 per-month subscription. There are eight Netflix original TV series, five documentaries and two films that are available locally in 4K, and with the company's regular releases of original titles, this list is likely to continue to expand.

Finally, even if you have all of the above, you're going to need more than an ADSL2+ Internet connection. Netflix recommends a minimum of 25Mbps for 4K streaming, which is just outside the bounds of ADSL2+ theoretical speeds and is likely to be far more data than your connection is capable of. Cable broadband, which runs over hybrid-fiber-coaxial, or a new NBN connection will be required if you intend on streaming your 4K content.

4K Blu-ray discs should appear early in 2016.



# Advanced Netflix tips & tricks

HOW TO TAP INTO THE US MARKET AND STREAMLINE YOUR EXPERIENCE.

IF YOU WANT to improve your streaming, it's worth knowing how fast your Internet speed is during peak viewing times. Plug an Ethernet cable into your laptop or connect your computer to the web over Wi-Fi (depending on how your streaming device is connected) and go to Ookla's browser-based speed test site ([speedtest.net](http://speedtest.net)). For SD streaming, you'll need a reliable minimum download speed of 2.5–3.0Mbps; for 720p resolution, you'll need more than 5Mbps; and Full HD needs over 7.5Mbps. If your Internet isn't reliably higher and you're not able to plug an Ethernet cable from your router to your streaming device, then the most significant step you can take towards better streaming is to see if you can get a cable broadband or NBN connection.

## ACCESSING GEO-LOCKED SHOWS AND MOVIES

Savvy streamers are likely already aware that the US version of Netflix has about six times the content that we do, which is not really as unfair as it sounds, considering the US has 20 times the subscriber base. If you want access to this library, though, you have two relatively simple options, apart from moving country; a virtual private network (VPN) or a service that tweaks your domain name system (DNS). VPN's have a few different uses and we covered them in depth in the May issue of Techlife (p.74) but one of their main purposes is their ability to circumvent geoblocks. VPNs tunnel your IP address through to servers in a foreign country so that sites and services on the other side of

your computer will think you're based in the country that the servers are hosted. There are a range of VPN services available all the way up from free products to US\$10 a month for the more expensive ones. Because VPNs feed all your Internet data through another server, they are an extremely secure way to access the Internet, but the downside of this broad security blanket is that it can slow down your Internet speeds. Free VPN servers will likely obliterate your ability to stream and even the fastest, paid VPN subscriptions slowed the APC lab's 100Mbps connection to around 35Mbps and took the Ping from 3ms to over 300ms. Buffered, Express VPN and Private Internet Access were some of the better services we tested costing US\$7–\$15 per month.

Alternatively, DNS services simply get you to change some numbers on your router domain, so websites reach out to the DNS services servers for your Internet's geolocation info. There are no security benefits from a DNS but it won't slow your Internet speeds down. Getflix ([getflix.com.au](http://getflix.com.au)) is a popular DNS that is aimed at Ausies and costs US\$3.95 a month, but if you just want US catalogues, you can get services like TV Unblock for free ([tvunblock.com](http://tvunblock.com)).

## HIDDEN COMMANDS

If your stream is struggling to buffer during peak times, there are a few hidden menus on Netflix's browser-based portal that allow you to manually set bitrate, look at buffering speed against playback speed, see where your stream is emanating from and view your viewing log.

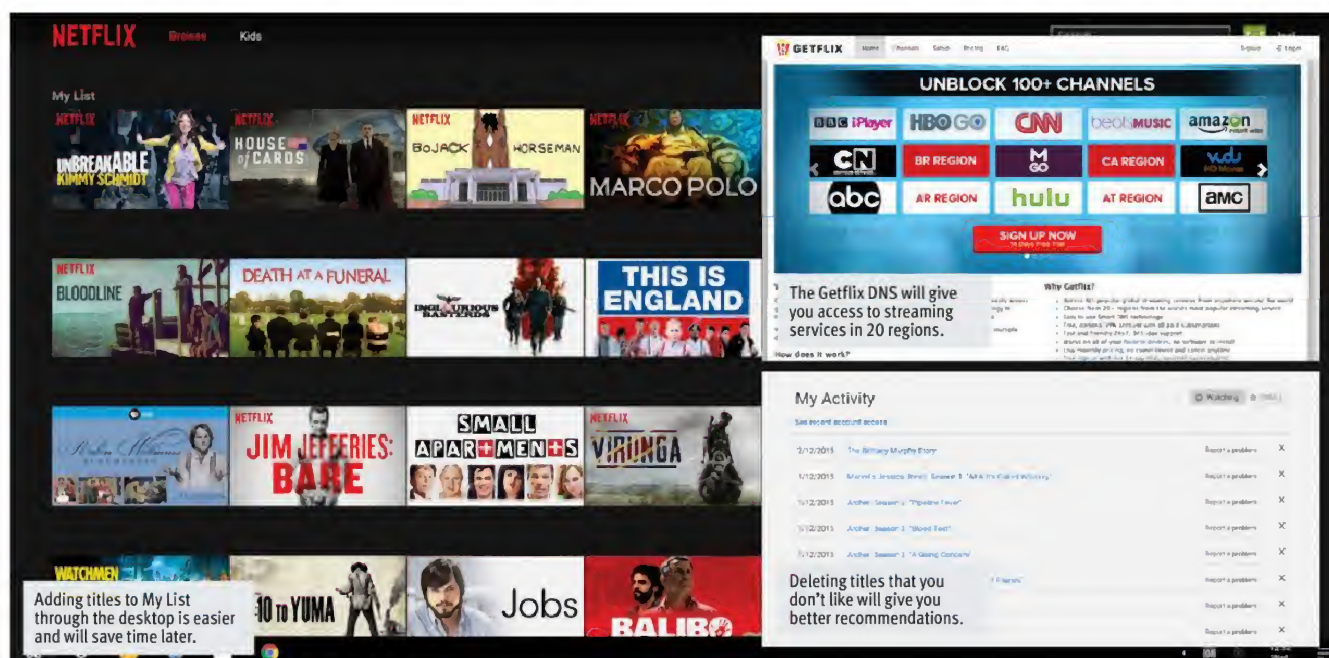
Ctrl-Alt-Shift-S will bring up the bitrate adjustment settings, Ctrl-Alt-Shift-D opens a stream diagnostics page with all the background stream info and Ctrl-Alt-Shift-L reveals your full viewing log. Adjusting your bitrate to match the playback speed will stop you having to constantly wait for buffering and though, generally, you'll want this high, if you're downloading something in the background, you can also limit your streaming bandwidth to allow for this.

## DELETE TITLES FROM VIEWING HISTORY

If you're the first account on your Netflix subscription, chances are your account history is going to cop the brunt of general household viewing habits. Because of Netflix's complex algorithms and the fact that it serves you up content based on your viewing history, you may want to delete the titles that you didn't actually watch. Netflix recommendations are a hell of a lot better when your history is in order. In the browser portal, go to Your Account > My Profile > Viewing activity and delete the titles you don't want in there. There's even a useful "remove series" link.

## USE MY LIST

Finally, media streaming hubs that you navigate with a remote, say Telstra TV or Apple TV, have paired down app interfaces that can be slow to navigate. Setting aside 30 minutes to trawl through Netflix content on your PC and adding titles to My List will save you heaps of time when you just want to put your feet up.





[ OUTSIDE THE MAINSTREAM ]

# Other streaming options

IT'S NOT JUST NETFLIX, STAN AND PRESTO: THESE ARE OUR FAVOURITE ALTERNATE APPS, WEBSITES AND OTHER TOOLS FOR STREAMING IN AUSTRALIA.

## APPS

### Gyde

Free | iOS | [www.gyde.tv](http://www.gyde.tv)



Gyde is a half Australian iOS app that aggregates the movie catalogues of a number of local streaming services

so you can easily look through a list of popular titles and click through to see where you can stream them. Plugging into Netflix Australia, Stan, SBS On Demand, iTunes Fetch TV, Quickflix, Crackle, Snagfilms and Dendy direct, you can turn each of these local content libraries on or off, depending on which ones you are subscribed to and only see the films you already have subscriptions for.

### Just Watch

Free | Browser, Android and iOS | [www.justwatch.com](http://www.justwatch.com)



Similarly to Gyde, Just Watch is a streaming search engine that lets you select your country and plug in to a

similarly long list of local streaming services. Though Gyde is purely for movies, Just Watch includes TV shows and has a slightly more sophisticated search engine that lets you organise lists by date or popularity and apply filters like cost, IMDb or Rotten Tomato ratings or release date. Just Watch scrapes catalogues from Netflix Au, Stan, Quickflix, Crackle, iTunes, Google Play, PlayStation, Xbox, Quickflix and Mubi.

### Crackle

Free | Apple TV, Roku, Chromecast, Smartphones, smart TVs, Consoles and web | [www.crackle.com](http://www.crackle.com)



You'll have to sift through a bit of junk on Crackle, but when you get access to a streaming catalogue that looks only fractionally worse than what Quickflix has been offering for years as a paid service, it doesn't seem like such a bad deal. Crackle is a subsidiary of Sony and actually has some half decent titles from time to time. It's at least worth worth checking in every month to see if there are any decent freebies.

### SnagFilms

Free | Smartphones, Xbox 360, Roku, Sony and Panasonic smart TVs | [www.snagfilms.com](http://www.snagfilms.com)



This free online portal for movies and TV shows has a couple of hidden gems and older classics that you can stream for free. We just added an older Academy Award-winning documentary, the 2007 Sundance finalist *Nanking* and a 2003 doco on the White Stripes to our list of bookmarked films from the Snagfilms catalogue and we

didn't even scratch the surface of what's available. A decent app to snag for movie buffs.

### Mubi

US\$6.99 p/m | Browsers, PS4, PS3 and select smart TVs | [mubi.com](http://mubi.com)



Whether you're looking for something different or just love cinema, Mubi offers a hand-picked collection of classic cinema. The business model is unique: Mubi's 'experts' pick a new movie every day, and you have 30 days to watch it. After that, it's replaced with something else, and on and on. At time of writing, David Cronenberg's *Dead Ringers* sat alongside Derek Cianfrance's *Blue Valentine*. Never heard of them? Jump on board and see what you're missing.

### Crunchyroll

Free, Premium \$6.95 | Telstra TV, Apple TV, consoles, smartphones | [www.crunchyroll.com](http://www.crunchyroll.com)



Crunchyroll is a free-to-air type streaming service from the US that hosts a decent collection of Anime, Manga and East Asian media titles. You can either watch for free, where shows will be distributed with advertising or sign up for a premium monthly subscription to remove them. The service has over 100,000 premium subscribers worldwide and contains over 15,000 hours of officially licensed content. This is a great streaming resource if you're looking for something outside of the box.

## OTHER TOOLS

### Netflix Enhancer

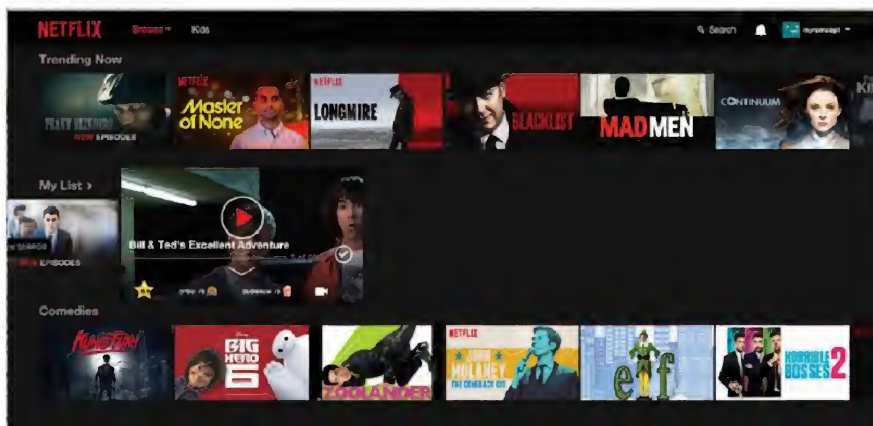
Chrome extension | [tinyurl.com/TLA46-NEnha](http://tinyurl.com/TLA46-NEnha)

This plugin reads scores from film review website Rotten Tomatoes, as well as user scores from IMDb, and inserts them into the title cards on Netflix. It's simple to use: install the plugin, make your way to Netflix and hover your mouse over a show or movie, and the scores appear at the bottom. You can then click on them to go to the respective website if you want to know more. It isn't perfect (*Master of None*, the 2015 TV show, directs to a 2009 doco of the same name on IMDb), but as a rough guide, it's a clever addition.

### Full movies on YouTube

[reddit.com/r/fullmoviesonyoutube](http://reddit.com/r/fullmoviesonyoutube)

The title says it all. This well-populated database filters by genre, decade and resolution, though there isn't a search function (you could just use YouTube for that). Nevertheless, you'll likely stumble on some classics (*Monty Python and the Holy Grail*), favourites (*Akira*, full subs) and a few you never knew existed (a version of *The Fantastic 4* made in 1994 but never released). Frankly, we're surprised that the whole thing hasn't been shut down as it's on the shadier side of a legal grey area. Also, don't expect every movie to be in HD, or even 480p. ■







[IN CONTROL]

# The best Aussie streaming-media box

THERE'S A HEAP OF STREAMING BOXES TO CHOOSE FROM, SO WHICH OFFERS THE BEST OVERALL PACKAGE FOR AUSSIES?

[STEPHEN LAMBRECHTS]

AS WE MOVE away from physical media and into the digital era, more Australian households than ever before are turning to streaming media players as a way to watch their video-on-demand services and downloaded content.

When choosing a media player, it's important to make sure that the device can take care of your primary needs. Are you after a device that will stream any file you throw at it, or are apps and services the most important factor to you? A player's user interface is also of the utmost importance, as you'll want something that is easy to navigate and set up — especially if you're planning on letting other members of the household use it.

As there are a number of media player options on the market, each with different strengths and weaknesses, we've put together a comprehensive roundup of the best devices currently available to Australian users. Here are six devices that will bring any HD television out of the stone age and into the streaming future.

06

STREAMING DEVICES

## HOW WE TESTED

Each device was tested wirelessly using an AirPort Extreme router over a high-speed broadband connection, in an effort to put extra strain on each player's wireless streaming capabilities. Each player was tested on a 4K UHD Sony Bravia TV. Sound was tested via HDMI passthrough, and also through the television's own speakers.

[WWW.TECHLIFE.NET]

[BUYER'S GUIDE]

## STREAMING DEVICE BUYER'S GUIDE

WHAT TO LOOK FOR WHEN SHOPPING FOR A STREAMING MEDIA BOX

### WIRED OR WIRELESS?

You can't have a streaming device without networking. Most devices should offer both wired (Ethernet) and wireless (Wi-Fi) built-in. If you can, use the wired connection, as it should offer more reliable connectivity and consistent speeds.

### WI-FI TYPE

When it comes to wireless networking support, you'll want to look for at least 802.11n with 5GHz, and preferably 802.11ac. This will ensure the streamer can handle the kind of bandwidth needed for HD streaming. Of course, you'll also need a router with at least 802.11n to match.

### DIRECT FILE PLAYBACK

Some streaming boxes will let you play back a variety of video files directly, with support for common filetypes like .avi, .mp4, .mov and .mkv. Others require your files to be shared by a DLNA media server device — many network-attached storage boxes have this, and there's software for PC and Mac that let them operate as DLNA devices.

### USB PORT

In most cases, if your media player has a USB port, it's there in order to let you play media files directly. Double-check this, however, as some players (including the Apple TV) use their USB ports for other purposes.

### NETWORK SHARES SUPPORT

Certain players, such as the WD TV, can directly read media files from folders shared on your local network, making it easy to watch videos you've downloaded from the web or shot and shared yourself.

### APPS

Networked media players are increasingly embracing the app-store model used by smartphones and tablets. The new Apple TV is the obvious example of this, but even older players like the WD TV will, to a certain degree, let you download and install optional 'app' extras.





## Apple TV

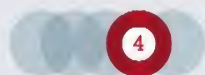
AN INSANELY POLISHED USER EXPERIENCE

AFTER A LONG period of stagnation, the Apple TV has been revitalised with the inclusion of a proper App Store, a Siri-enabled remote (which doubles as a big-screen iOS game controller) and a number of other bells and whistles. Gone is the outdated interface seen in previous Apple TV models, with the Cupertino company's new tvOS giving the device a beautiful iOS-inspired sheen. Using the Siri Remote to navigate by voice works surprisingly well, allowing you to search for content across your iTunes library, the iTunes Store and several integrated apps (like Netflix and Apple Music) just by pressing its microphone button and asking aloud. You can even say stuff like "What did he say?" during a film, which will make the Apple TV rewind slightly and temporarily enable subtitles. Though the Apple TV is limited in the types of files and formats it can natively play, you can install the Plex app and stream just about anything from a PC or Mac via live transcoding. It's as easy to set up as an iPhone. Admittedly, the Apple TV is still finding its feet in terms of optimised apps — while a tvOS-optimised version of Netflix is already available, apps like Stan and TENplay are still based off previous Apple TV generations. Optimised versions will surely come, but at the moment, these apps aren't able to take advantage of Siri voice search. It's also disappointing that a device as new (and expensive) as this is limited to a maximum resolution of 1080p, especially when cheaper US alternatives like the Roku 4 and Amazon Fire TV now support 4K.

## Google Chromecast

A FANTASTIC STREAMING ENTRY POINT

AN INGENIOUS AND affordable way to get Smart TV functionality on a regular HD television, Google's Chromecast is the perfect starting point for anyone that wants to see what streaming media is all about. Simply plug the Chromecast into one of your TV's HDMI ports and connect it to your Wi-Fi network. Now, you can cast web content over to the Chromecast from any PC, Mac, iOS or Android device. It comes with a micro-USB-to-USB cable, so if your TV has a USB port on it, you can power the device directly from your television set instead of taking up another power point. The Chromecast is controlled entirely from your phone, tablet or computer, which means it has no remote control or built-in apps of any kind — all control is handled by individual apps on your smart device. Admittedly, this is not an ideal way to browse streaming services Netflix, Presto and Stan, but it's simple and works well enough to justify the Chromecast's incredibly low price point. Occasionally, our streams would crash or start buffering in the middle of playback; however, it didn't happen often enough to pose a significant problem. What's really great about the Chromecast is how portable and convenient it is. Looking like a slightly oversized USB stick, the device can easily be carried in your pocket and plugged into a nearby screen at the drop of a hat. Though it has some niggles, the Chromecast is as streamlined and simple as a media player can get.



### APPLE TV

\$269 (32GB) / \$349 (64GB)  
[www.apple.com/au/tv](http://www.apple.com/au/tv)

#### CRITICAL SPECS

HDMI 1.4, Bluetooth 4.0, IR receiver, AirPlay functionality, USB-C, 32GB or 64GB storage, A8 processor, Wi-Fi 802.11ac, H.264 video (.m4v, .mp4 and .mov file formats), AAC, .mp3, AIFF, WAV, Apple Lossless, Dolby Digital 5.1 and Dolby Digital Plus 7.1 audio



### GOOGLE CHROMECAST

\$49  
[www.google.com.au/chromecast](http://www.google.com.au/chromecast)

#### CRITICAL SPECS

HDMI 1.4, Wi-Fi 802.11n, USB 2.0, WEP, WPA, WPA2 encryption



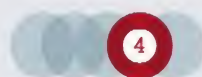




## WD TV Media Player

A FANTASTIC MEDIA STREAMER BUT LIMITED IN TERMS OF APPS

WESTERN DIGITAL'S MEDIA player, the WD TV, is an unassuming little box. Inside its small, somewhat cheap-looking plastic shell is a machine that'll play pretty much any file format you throw at it (and natively, at that). Rather than having to fiddle with settings within a bunch of third-party media player apps, the WD TV lets you connect directly to your media server or NAS over Wi-Fi or ethernet, instantly playing HD content without the need for problematic transcoding — even large 1080p .mkv files stream like a dream. It's also got the ability to decode Dolby Digital Plus and DTS, making it ideal for streaming your movie library. Admittedly, the WD TV is sorely lacking in the apps department — while big hitters like ABC iView, Netflix and Spotify are available, almost all of the other apps won't have much content to offer Australians. If you're looking for a machine that'll stream Australian SVOD services like Stan, Presto and Quickflix, and catchup services like TENplay and 7Plus, you'll have to look elsewhere. While its default interface isn't very appealing, its secondary UI is colourful and simple to use, displaying files in an easy-to-read grid. Miracast functionality also lets you throw a device's display up on your TV screen, though expect a little lag. Though the WD TV isn't great for apps and accessing local streaming services, as a secondary device used exclusively for streaming all the video and music files on your home computer or network storage, it is absolutely unbeatable.



### WD TV MEDIA PLAYER

\$149  
[www.wdc.com](http://www.wdc.com)

#### CRITICAL SPECS

HDMI 1.4, Optical out, USB 2.0, file support: AVI, VOB, MKV, MPEG-1, TS, TP, M2TS, FLV, MP3, WAV, PCM, WMA, AAC, FLAC, OGG, BMP, GIF, JPG, PNG, TIFF, DTS/Dolby Digital Plus audio output, Wi-Fi 802.11n, Ethernet



## Google Nexus Player

GOOGLE'S ANDROID TV DEVICE IS A GOOD FIRST STEP

ONE OF THE more attractive and compact media player devices on the market, the puck-shaped Nexus Player provides an affordable way to bring smart TV functionality to your regular HD TV set. After logging into your Google account, you'll be presented with a home screen displaying a number of apps and recommended clips and movies. Streaming services like Netflix, Quickflix and Animelab are accessible here, and more are available to download from the Google Play store. Admittedly, there aren't as many native Android TV apps to try out as we'd like, though that'll hopefully change as developers start to support the platform. The Nexus Player does not provide a way to natively play your networked media, however, your library can be accessed via Plex. Just like Google's Chromecast, you can also cast web content to your Nexus Player in order to view it on-screen. As a cheap, mini gaming console, there's plenty of potential in the Nexus Player. Though there's only a small selection of Android games available to play on the big screen, the experience is quite smooth — especially when paired with the device's optional Nexus Gamepad controller (\$59). While the Android TV experience is somewhat limited so far, it feels great to use. Its voice-activated remote is a great content-searching tool, and most apps designed for TV are responsive and user friendly — the Android TV version of YouTube Leanback is particularly great — however, more apps are needed to make the Nexus Player a truly compelling addition to your living room.



### GOOGLE NEXUS PLAYER

\$129  
[www.google.com/nexus/player](http://www.google.com/nexus/player)

#### CRITICAL SPECS

HDMI 1.4, 1.8GHz Quad Core, Intel Atom processor, 1GB RAM, 8GB storage, Wi-Fi 802.11ac 2x2 (MIMO), Bluetooth 4.1, Micro-USB 2.0, voice-activated remote







## Telstra TV

THIS REBADGED ROKU 2 LEAVES A LOT TO BE DESIRED.

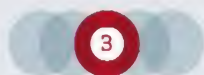
AS THE FIRST official Roku product released for Australian users, the Telstra TV is somewhat of a disappointment. Though it offers access to Australia's major streaming services, like Netflix, Stan and Presto (the only device to offer all three, to date), the Telstra TV is locked to Telstra's network, meaning you'll need a Telstra account to use it. In terms of hardware, Telstra has opted to use a rebranded Roku 2 box, making the Telstra TV two generations behind the 4K-ready Roku 4 that was recently released stateside. Its restricted DNS settings also mean that you can't set your Telstra TV to play overseas versions of Netflix (or most of the other apps usually available to Roku boxes other territories), which will be a major drawback for many users. While the device is able to play .mkv files using the Roku Media Player app, it should be noted that the Telstra TV doesn't decode Dolby Digital audio — that means you'll need to have your device connected to an AV receiver with HDMI passthrough capability in order to hear anything. Though the Telstra TV has its share of downsides, users who are only after access to local streaming and catch-up services will find a lot to like about the rebadged Roku box. Its user interface is clean, easy to use and fairly responsive, and setting up the device is a cinch. If you're a Telstra customer who's after an affordable, hassle-free streaming box that provides loads of local content, you could do worse than the Telstra TV.



## Strong Rock Box 4

BEASTLY SPECS CAN'T MASK AN UNINTUITIVE USER EXPERIENCE.

LESS A TRUE Android TV experience and more an Android tablet that uses your TV as its screen, Strong's Quad-Core Rock Box 4 packs a lot of grunt in terms of specs, but feels lacking as a media player. Navigating a traditional tablet-style Android interface with a remote is a cumbersome affair, making it damn near impossible to select certain items without resorting to a mouse pointer mode that takes forever to get out of (alternatively, you can pair a wireless keyboard and mouse to the device to make the experience much more tolerable). The Rock Box 4 runs an outdated version of 4.2.2 Jellybean, meaning that apps like Netflix must be individually updated from within the Google Play store in order to work. Even then, the version of Netflix you end up with is far from the latest version. You can plug a USB hard drive into the Rock Box 4 to instantly access video files via the preinstalled MX Player app, and files on your computer can be accessed using the device's XBMC app (savvy users will be able to access overseas TV catch-up services, too), though you're better off downloading Plex instead. Though it isn't an ideal media player, you can use the device to play Android and Emulator games using a USB-connected game controller, though this will require a fair amount of tinkering in settings. It's also very expensive — you can buy the infinitely more polished Apple TV for roughly the same price. For a more user-friendly Android experience on your TV, you're better off with the Nexus Player.



### TELSTRA TV

\$109

[www.telstra.com.au/TelstraTV](http://www.telstra.com.au/TelstraTV)

#### CRITICAL SPECS

Dolby 7.1 and 5.1 surround pass through via HDMI, microSD (up to 16GB), Dual Arm A9 1GHz Processor 32KB L1 Cache, 512MB DRAM, 256MB Flash internal memory, Wi-Fi 802.11 with WEP, WPA and WPA2 support



### STRONG ROCK BOX 4

\$299

[www.rock-box.com.au](http://www.rock-box.com.au)

#### CRITICAL SPECS

HDMI 1.4, Android 4.2.2, RK3188 Cortex A9 1.9GHz quad-core processor, 2GB RAM, 16GB storage, microSD card reader, Wi-Fi, Bluetooth







(CONSOLE SPECIAL)

# Games consoles for media streaming

IS THE BEST MEDIA PLAYER SITTING RIGHT UNDER YOUR NOSE?

## XBOX ONE

Though its status as a go-to gaming console may be up for debate this generation, any sacrifice Microsoft has made to the Xbox One's graphical grunt is mostly made up for when it comes to its position as a general entertainment system. Aside from the console's OneGuide functionality, which gives you DVR control over broadcast television, there are a host of streaming and catch up services available to the Xbox One. Its Netflix app allows for Kinect voice control, with the usual play/pause commands and the ability to select episodes by number. If you're a Foxtel subscriber, you can stream all your favourite channels with the Foxtel Play app, and catch up services like PLUS7, TENplay and SBS On Demand are also on offer, though the long-promised ABC iView app is still missing. Curiously, Stan is a no-show on Xbox One, despite being available on PlayStation consoles, though if you're a masochist, you can sign up for Quickflix. Anime fans also have access to Crunchyroll, though the superior AnimeLab app is sadly absent. Plex is also available in **Preview form.**

## PLAYSTATION 4

Much like its main console competitor, the Xbox One, Sony's PlayStation 4 packs a whole lot of added media functionality for when you don't feel like gaming. Though the PS4 lacks Xbox One's DVR functionality, the number of streaming and catch-up apps on offer make the console a worthy contender as your living room's entertainment centrepiece. Like the Xbox, Foxtel Play is ready and waiting to be installed for those with Foxtel subscriptions, and catch-up services PLUS7 and SBS On Demand are also available. Unlike Microsoft's box, ABC iView is available to download, though TENplay is curiously absent. Netflix and Quickflix apps are also on offer, with the added bonus of a Stan app, too. If you're an Otaku at heart, consider Sony's console as your home of anime, with access to both the Crunchyroll and AnimeLab streaming services. Wrestling fans also have cause to celebrate, as the WWE Network app is accessible. The Plex app also lets you stream your networked media. Finally, the Spotify app lets users log into their accounts and stream **bangin' tunes while playing games.**



SUPERGUIDE  
THE BEST AUSSIE STREAMING MEDIA BOX



## OLDER CONSOLES

STILL HAVE A PS3 OR XBOX 360 KICKING AROUND? THEY CAN DO STREAMING TOO...

Chances are that your last-gen consoles are gathering dust somewhere while you focus your attentions on your shiny current-gen gaming boxes. If that's the case, you can always grant them second lives as media players. Xbox 360 has an even better range of streaming and catch up apps than its successor, with Netflix, Quickflix, Animal Planet LIVE, Foxtel Play, Crackle, Crunchyroll, Major League Gaming, MLB.TV, NBA Game Time, SBS On Demand, TENplay, ABC iView and UFC on offer, along with a few other web content apps. PlayStation 3 also has a commendable lineup of apps, including Netflix, Quickflix, Stan, Crunchyroll, AnimeLab, ABC iView, SBS On Demand, PLUS7, Foxtel Play, Plex, WWE Network and Spotify, as well as a number of smaller content apps. Both the Xbox 360 and PlayStation 3 offer more functionality and services to stream than many of the media player options listed in our roundup, so if you already own either of them, why not put them to good use? And if you don't own them, we recommend each console as an inexpensive and robust media player solution.





[SMART TV]

# Finding the smartest TV

WE DISCUSS HOW TELEVISIONS ARE CHANGING AND WHERE THEY'RE HEADING.

[DARREN YATES]



NOT LONG AGO, buying a new TV simply boiled down to one question — plasma or LCD (and not long before that, Sony Trinitron or something else). Back then, our viewing choices weren't much chop, either. You chose to put up with free-to-air TV stations and their schedule-mangling, shifting your favourite shows to the dead of night, or you cut the antenna cable, pulled out your *Buffy* DVD box set or PS3 and enjoyed alternative entertainment instead.

But the advent of on-demand video streaming services such as Netflix and Stan, combined with new technology in OLED and 4K resolution over the last year or two, has left the TV market virtually standing on its head. But potentially, even these changes may struggle to stack up against what could be one of the most significant changes to hit TVs in the last 15 years — the introduction of the TV operating system.

## TVs BY OPERATING SYSTEM?

Up until around 2011, TVs were mostly **what** they'd always been — primarily display devices. Sure, the tech and connectivity **had** changed enormously, but they were still **dumb** devices — you pressed buttons, whether **on the** TV or its remote, to achieve one of a fixed **and** limited number of built-in functions.

The advent of smart TVs brought **internet** connectivity along with the first green **shoots** of on-demand video streaming and local media playback. But for the most part, you were still looking at custom, proprietary interfaces and software, with occasional **and** mostly forgettable attempts at web browsing and gaming.

Today, we're seeing the arrival of **Smart TV** 2.0, thanks largely to new Linux-based platforms where the emphasis is on apps **and**

the ecosystem. In short, the smartphone/tablet app world has hit the TV, as these display devices aim to become the ultimate all-in-one home entertainment system.

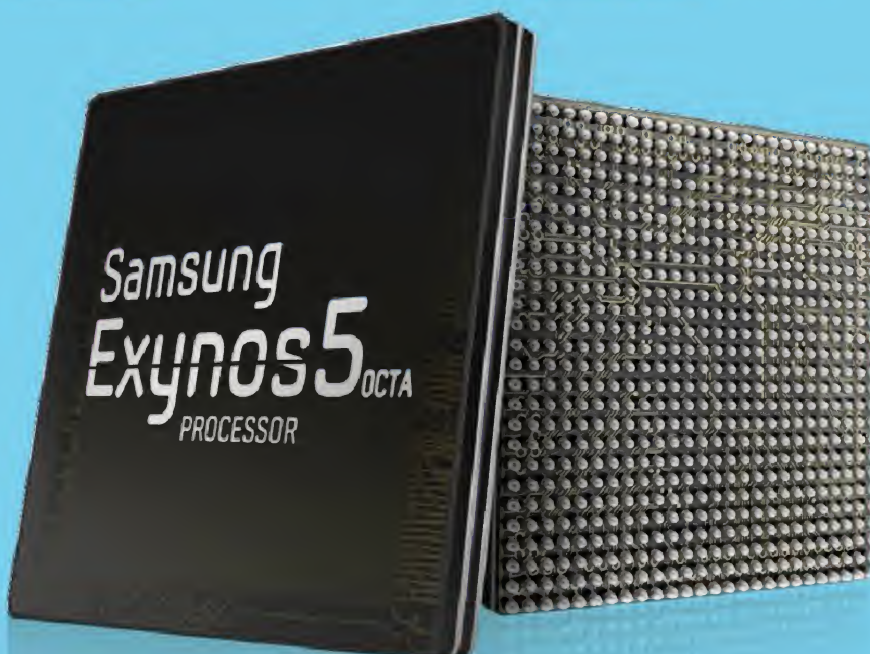
## IS 'SMART' ALL THAT SMART?

But with this new frontier comes questions. For starters, three of the top TV brands (LG, Samsung and Sony) also happen to be three of the major phone makers, so it's pertinent to ask how long can these new TVs expect to receive OS update support? So far, only LG is up to its second-generation of OS-based TVs, which, this year, feature the new WebOS 2.0 operating system. But recently, the Korean brand announced this new OS would also be made available as a free update to last year's first-gen WebOS TVs. Beyond that, however, no TV-maker has made its long-term update intentions clear.

Smart TVs are evolving from display devices into all-in-one computers where the emphasis is at least as much on the app store ecosystem as it is on image quality. And that could have far-reaching consequences on the practical lifespan of these devices, particularly given the typical two-year device turnover in the smartphone market.

Along with OS updates comes the issue of CPU power — these new TVs variously feature dual, quad or eight-core CPUs, but how long will dual, quad or even eight-core CPUs provide sufficient performance? Five years ago, we all wandered around with single-core smartphones. Today, you don't buy a phone without a quad-core chip, so how will today's TVs fare five years from now?

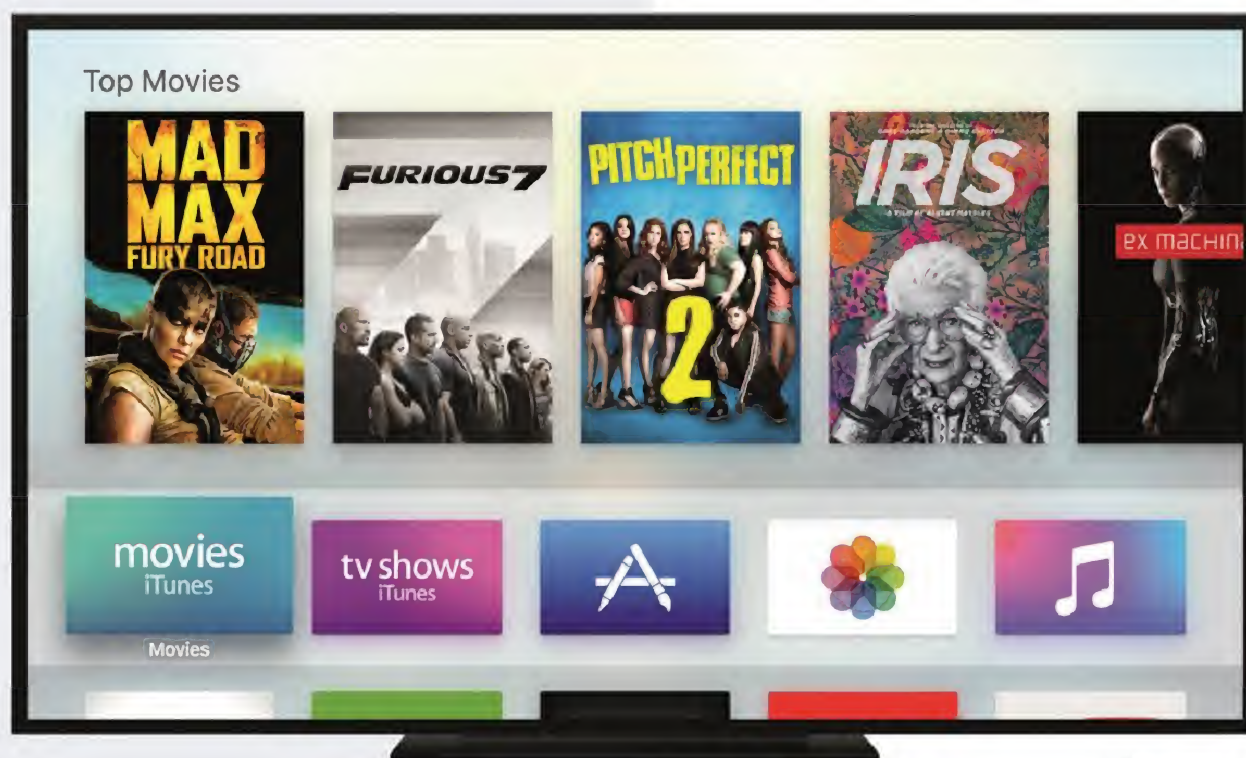
Throw in 4K resolution, OLED technology, on-demand streaming and TV has quickly entered a brave new world.





## TV OPERATING SYSTEMS

TAKING A CLOSER LOOK AT THE OPERATING SYSTEMS POWERING THE LATEST TVs.



## Apple tvOS

AVAILABLE IN APPLE TV

THE IDEA OF talking about operating systems for TVs sounds weird, but when you understand just how quickly TVs are becoming glorified loungeroom all-in-one computers, it quickly makes sense. The future of TV is, all of a sudden, being talked up as all about apps. The ecosystems Google and Apple have created around smartphones and tablets are eyed off with envy by the TV makers, many of whom are struggling to turn a profit from their TV-building adventures, some of them for a number of years.

And the big names are all having a crack at it differently. Korean giants LG and Samsung are going for the full-on Apple-like ecosystem, where they control not only their own hardware, but the operating system and app store that go with it. On the other side, Panasonic and Sony have chosen Mozilla Firefox and Google's new Android TV, respectively, to run their smart shows. For Sony, the relationship is nothing new, as the two already collaborate over tablets and smartphones.

As usual, Apple has its own strategy, but one that could be the smartest of all. Apple's main goal with Apple TV isn't to sell TVs, but to sell yet another ecosystem. Smartly, it's not in the business of selling TVs, but by making a relatively inexpensive external box, it cleverly sees every TV with an HDMI port as its potential market.

However, for consumers, the real question is can the TV market support five different OSs and ecosystems? Unlikely. Nevertheless, we've tried out all five and here's what we found.

OKAY, SO APPLE'S new tvOS might not exist in an actual TV, but the latest fourth-generation Apple TV, which sports the new OS, still marks a significant shift in the way Apple does TV. You don't need to look far to see it, either — Apple's advertising for Apple TV loudly and proudly proclaims "it's all about the apps". That's hardly surprising, given its new iOS-style tvOS comes complete with an app store to one of the few remaining home entertainment frontiers it doesn't completely own already.

But the one great bonus tvOS has here is that it's external to your TV, it works with any HDMI-equipped TV — and although starting at \$269, more than double the price of the previous-generation model, it's still a lot cheaper than buying a new telly.

The new lean Siri Remote is easy to drive (except when buying apps and having to type in your password each time) and it's surprisingly not as uncomfortable to hold as we had expected. It doubles as a Wii-like game controller with accelerometer and gyroscope, while holding the mic button down lets you talk Siri's ear off.

The current tvOS version 9 feels and looks like a cleaner, leaner version of iOS — it's smooth and responsive, but on the back of Apple's fast A8 CPU (the chip powering the iPad mini 4), so it should be.

As for rumours of an actual Apple TV? We'll put the kiss of death on it by saying Apple will never make one in a million years. Seriously, they'd be absolutely mad to do it.





## Google Android TV

AVAILABLE IN SONY WEBOS SERIES AND UP, SELECTED SHARP AND PHILIPS MODELS

THE OBVIOUS QUESTION here is what has Google got right this time with Android TV that it didn't with Google TV? Unfortunately, the answer is a little less obvious. On the plus side, Android TV is a fork of Android 5.0/Lollipop — that means it essentially has the same nuts and bolts as your Android phone or tablet. That gives it access to Google Play and its content ecosystem, although you won't find too many Android TV apps at the moment. The good news is that software developers can create Android TV apps with the same Android Studio tools used for phone and tablet apps (see [www.developer.android.com/training/tv/index.html](http://www.developer.android.com/training/tv/index.html)).

The downside is that it's a fork of Android 5.0/Lollipop. What do we mean? Well, for those looking for a lean TV system, this more or less runs like a smartphone or tablet OS. For example, you need a Google account to sign in to features and owners have reported the initial update on first boot can take a serious amount of time.

Using the OS is fairly straightforward if you're a confident Android user, with the category selections similar to Google Play's category bars. We tested it on Sony's new 55-inch X8500C model and it was smooth and responsive enough using the traditional remote, but you can't help thinking this feels a lot like using a tablet, rather than a telly and, personally, that's not really what I want when I sit down in front of the box. So far, OS updates seem to be flowing, but we wonder whether there'll be more than the two years of OS updates that phones and tablets typically rate at the moment.



ON THE PLUS SIDE, ANDROID TV IS A FORK OF ANDROID 5.0/LOLLIPOP — THAT MEANS IT ESSENTIALLY HAS THE SAME NUTS AND BOLTS AS YOUR ANDROID PHONE OR TABLET.



FOR GENERAL OPERATION, WEBOS IS EASY TO USE — YOU USE THE REMOTE TO SELECT FROM A SERIES OF SLANTED TILE ICONS TO CHOOSE YOUR DESIRED SERVICE. STREAMING SUPPORT INCLUDES NETFLIX AND, JUST AT TIME OF TESTING, A NEW STAN APP WAS ANNOUNCED.



## LG WebOS

AVAILABLE IN LG 2000 (10.1), 1000 (2.0) AND UP, URBAN SERIES AND UP

WEBOS HAS A pedigree that reaches back to the Palm Pilot PDAs of the early 2000s, before being sold to Hewlett-Packard in 2010. The US tech giant later licensed it to LG, who reworked it and introduced its first WebOS TVs last year. Its 2015 class of smart TVs currently available run WebOS 2.0.

For general operation, WebOS is easy to use — you use the remote to select from a series of slanted tile icons to choose your desired service. Streaming support includes Netflix and, just at time of testing, a new Stan app was announced.

As you move through, the current tile is raised, similar to Mac OS X's Dock. WebOS also controls the TV settings, but thankfully, LG has rethought its remote control from last year's models and now provides a larger, better featured unit that combines more direct-access function buttons, along with the Wii-mote style control in the one unit.

WebOS is actually nicely done — the remote/cursor movement link speed is good, even though LG only does dual-core CPUs in its 1080p models. But the OS theme, animations and general styling are smooth and look great. We especially give LG props for making this new WebOS 2.0 release available as a free update for first-gen WebOS TV owners. Again, we can only wonder how long this update support will continue, but it's an excellent start we hope other brands will follow.

If you know HTML, CSS and JavaScript, you can start building your own WebOS TV apps using free, open-source tools — head to [www.developer.lge.com/webOSTV](http://www.developer.lge.com/webOSTV) for more.





## Panasonic Firefox OS

AVAILABLE IN CX700A SERIES AND LATER.

OF ALL THE various options, Firefox OS — at least as a TV operating system — is the one we fear for most. The Sydney Morning Herald's Adam Turner, while reviewing a Panasonic Firefox-equipped TV, aptly described it in phone parlance as more a "feature TV than a smart TV" ([www.tinyurl.com/oevbkd8](http://www.tinyurl.com/oevbkd8)). We tested it on a 55-inch CX700A and it does have a very minimalistic feel. First, the interface is definitely lean with just three screen buttons greeting you when you press the remote's Home button. Second, the My Home Screen apps cupboard isn't exactly bursting at the seams with options. We think it's doubtful the TV market can sustain five different OS ecosystems and, to us, Firefox is the weakest of the five in that regard. Panasonic's TV market share was variously quoted at the beginning of 2015 as around 4%. That will make it less enticing for developers to create more apps and it's difficult to see Firefox excelling as a TV OS on a market share of just 4%.

The CX700A has a four-core CPU inside, which does make the OS responsive, but we couldn't say more so than LG's Web OS 2.0. Personally, the circle theme grated on me, but I'm happy for that to be a more *personal taste* thing.

At time of writing, Firefox OS didn't have an app for on-demand streaming service Stan — something Samsung, Sony and LG enjoy. Throw in the perennial question over OS updates, available apps and this one is hard to back. Still, if you want to code Firefox OS TV apps yourself, see Mozilla's website at [www.tinyurl.com/opatuyz](http://www.tinyurl.com/opatuyz).

WE THINK IT'S DOUBTFUL THE TV MARKET CAN SUSTAIN FIVE DIFFERENT OS ECOSYSTEMS AND, TO US, FIREFOX IS THE WEAKEST OF THE FIVE.



WHILE IT GIVES YOU THE USUAL STREAMING SUSPECTS SUCH AS NETFLIX, STAN AND IVIEW, LIKE THE OTHERS, IT PERMEATES RIGHT THROUGH THE TV, HANDLING ACCESS TO SETTINGS AND AIMING FOR A WHOLE-OF-TV EXPERIENCE.



## Samsung Tizen

AVAILABLE IN - SERIES S JS500 AND UP

TIZEN IS THE Linux-based operating system that now powers Samsung's Smart Hub. Officially, it's backed by a host of brand-names from Intel to Samsung, NEC to Panasonic, but for now, it's only Samsung putting it into its 2015-era TVs. While it gives you the usual streaming suspects such as Netflix, Stan and iView, like the other OSs, it permeates right through the TV, handling access to settings and aiming for a whole-of-TV experience.

And it's pretty decent — fast, with minimal delay between you requesting and it doing. We tested Tizen on a 55-inch Series 8 model, but we're not sure the spartan Smart Hub remote will suit everyone. For feature-finding, it works, but if you're used to the more traditional button-for-everything remote, it may begin to grate. The whole screen-typing thing is something all OSs struggle with and we think Tizen is no exception. We found the app store also gets a little cluttered with too much detail (not sure you really need to know the file size of each store app, for example).

But a key factor that helps responsiveness is Samsung's choice of incorporating quad-core CPUs into its full HD and lower-end UltraHD models, going as far as eight-core in its flagship Series 9 screens. LG, by comparison, only uses dual-core CPUs in its full HD TVs and keeps quad-core chips for UHD models.

Tizen might seem to be yet another arguably perilous one-brand OS, but when that brand has nearly a quarter of the global TV market, it's better off than most. Start making your own Tizen apps by heading to [www.samsungdforum.com](http://www.samsungdforum.com) for details.





**TECHLIFE PICKS: THE TOP TV BUYS**  
IN THE MARKET FOR A NEW TELLY?  
TECHLIFE PICKS ITS FAVOURITE FIVE TO  
SUIT DIFFERENT NEEDS AND BUDGETS.

WITH ALL OF the different feature options to consider — image quality, size, CPU power, operating system and games performance, just for starters — picking the right TV is damned hard work. The good news is prices have never been lower and with their ability to act as a one-stop shop for free-to-air, web and on-demand streaming services, smart TVs can be a clean, easy choice.

But ultimately, buying a TV at any price point still comes down to two main criteria — size and image quality. And here's one thing to remember — more often than not, a larger TV from a lower-quality series will near-on price-match a smaller TV from a high-level series from the same vendor. If you're working to a budget, you decide which factor matters more.

But our top tip is make sure you try out the remote control before you buy a TV. Traditional and 'magic' remotes often work very differently and, given the prevalence of new smart OSs, you must try before you buy.

To cut down on the run-around, here's our top TV picks for various needs and budgets.

#### BEST BUY — COMPACT TV

### Sony KDL32W700C

FEW FANCY EXTRAS, OTHER THAN EXCELLENT  
IMAGE QUALITY.

OUR ASSUMPTION HERE is if you're after a compact TV, it's for single- or two-person viewing at most, possibly even for gaming use. We considered any TV up to 40-inches fair game for this one, but settled on Sony's 32-inch W700C. It's not a Triluminos panel, it's not an Android TV and it uses the old Sony Entertainment Network smarts, but it has a number of important features.

First, its picture quality is excellent — colours look beautifully natural, the 1080p resolution in a 32-inch panel means you should never see a pixel, and although only an edge-LED-backlit LCD panel, it's not the worst for contrast you'll see by any stretch. Viewing angles were excellent, particularly off-centre with no obvious colour inversion. It has Netflix on-board, no Stan, but Chromecast will soon fix that. You get Wi-Fi built-in, it supports Miracasting and doesn't waste money on 3D. We're not particularly enamoured with the base, however, as it seems a bit small and light.

If Android TV doesn't do it for you, but you still want the classy Sony image quality in a compact size and at a bargain price, here's your first stop.

#### SONY KDL32W700C

\$595  
[www.sony.com.au](http://www.sony.com.au)

#### USING IT

This isn't a smart TV, but the colour and detail are excellent and more than compensate.



#### BEST BUY — 4K TV

### LG 55EG960T

OLED AND 4K, BUT WISH IT WASN'T CURVED.

IF EVER THERE was to be a TV match made in heaven, it'd be combining OLED display technology with 4K resolution. Right now, Korean giant LG is the only brand to have this marriage available in Australia. The 55EG960T is the smaller of the two models, but given the 65-inch 65EG960T sells for not far off double the street price, this 55-inch version will do nicely.

First up, image quality here is simply brilliant. If you're used to living off LCD TV, the depth of blacks from OLED are exceptional, almost overpowering to the point of sucking out your eyeballs and there's so much resolution available, you'll need Netflix 4K and plenty of bandwidth just to show it off.

WebOS 2.0 is a decent OS and with quad-core processing, the EG960T is nimble through the menus. Throw in Netflix and now new support for Stan on-demand streaming and you won't be short of entertainment.

But personally, I'm not sold on the screen curvature here, particularly if you're sitting off-centre. Otherwise, if that doesn't bother you, this is about as good as TV gets right now. Finally, a quick shout-out to Samsung's Series 9 JS9000 as runner-up.

#### LG 55EG960T

\$4,500  
[www.lg.com/au](http://www.lg.com/au)

#### USING IT

Beautiful image quality, WebOS 2.0, Netflix and now Stan on-demand streaming. Not sold on curved panel though.



**BEST BUY — UNDER \$1,000****Samsung UA40J6200**

BIGGER ISN'T ALWAYS BETTER.

WE WERE SORELY tempted by retailers dropping the price on LG's 49-inch WebOS 2.0-equipped LF6300 to \$999 also, but in the end, chose Samsung's 40-inch J6200 by the smallest of margins. To be fair, comparing a 49-inch TV with a 40-inch model is difficult when you also try to base judgements on image quality at the same price. However, we think the Samsung does enough to compensate, with better detail and colour accuracy. Still, if size matters, we suggest you compare them yourself (most retailers should have both on display). Reports are the J6200 does better for input lag, making it the better of the two from a gaming perspective.

The Australian J6200 comes with Samsung's Tizen 'Smart Hub' OS and not a bad choice. WebOS does have an extra generation under its belt, but the two both have Netflix and now Stan, so although their respective app stores aren't overflowing, there's sufficient support coming through from service providers. There's no 3D here, which just means you're not wasting money on tech you'll likely never use. We didn't notice any colour dimming on wide-angle viewing. All up, a good choice at this price.

**SAMSUNG UA40J6200**

\$998  
www.samsung.com/au

**VIEWING**

Plenty of choice under \$1000, but couple Tizen with good image quality and you have a winner.

**BEST BUY — UNDER \$2,000****Samsung UA55JU7000**

YES, WE CAN COUNT, BUT IT'S WORTH THE PRICE.

UNFORTUNATELY, CURRENT STREET pricing doesn't neatly fit our price categories and around this price, Samsung's 55-inch Series-7 UltraHD JU7000 is a cracking TV, but typically goes for around \$2,200. The more entry-level 55-inch Series-6 UltraHD JU6400 sells for \$1,700, but the JU7000 gives you a better panel — it's a true 100Hz model and features dual DVB-T tuners whereas the JU6400 is only 50Hz and has only the single tuner. Just check the off-centre colour stability with the JU7000 — there are reports that viewing on an angle results in colour loss at the opposite screen edge, but we looked closely for it and couldn't see any issues. The word is that input lag is also excellent, so it should be fine for gaming.

The JU7000 gives you Samsung's Tizen OS, coupled with a minimalist smart remote where you rest your thumb on the activity sensor to activate the OS cursor. Menu performance is smooth, thanks to the quad-core CPU underneath.

Hopefully, by the time you read this, the price should be close to dipping under \$2,000 — either that or learn to haggle...

**SAMSUNG UA55JU7000**

\$2,200  
www.samsung.com/au

**VIEWING**

Yes, it's slightly over \$2,000, but the JU7000 is a beautiful 4K TV worth the money.

**BEST BUY — UNDER \$3,000****Samsung UA55JS8000**

OLED OR 4K — YOU CAN'T HAVE BOTH AT THIS PRICE.

THIS WAS ALSO a difficult choice. LG's 55-inch EC930T Full-HD OLED TV just dipped under \$3,000 on the street for the first time during testing, putting it up against the same-sized 4K-pixeled JS8000 LED LCD model from rival Samsung. In the end, it was like choosing between chocolate and cheese, but we just came down on the side of the JS8000.

The LG features WebOS version 1.0, albeit with a free 2.0 update available, but it'll still be a dual-core model up against the JS8000's quad-core chip and Tizen OS.

The EC930T delivers perfect contrast, thanks to its OLED pixels, but the JS8000 counters that with excellent image quality through its processing and 4K resolution. Personally, I don't like the distorted geometry of curved panels, which helped in choosing the flat-screened JS8000. Both offer smart remotes, meaning gyroscopic cursor control and few function-specific buttons.

It's true the only 4K content you'll likely see over the next year is whatever Netflix and your broadband connection can deliver, so it's still a difficult choice. However, the LG being curved and essentially last year's tech gave us the nudge towards the JS8000.

**SAMSUNG UA55JS8000**

\$2999  
www.samsung.com/au www.xxxx

**VIEWING**

OLED for under \$3,000 is tough to pass up, but the JS8000 does enough to warrant selection.



[IN CONTROL]

# One remote to rule them all

NO LONGER JUST FOR YOUR TV.

[LINDSAY HANDMAR]

NOTHING IS MORE frustrating than a missing remote, but almost as annoying is the gaggle of controllers that can adorn a coffee table in a tech-loving household. Universal remotes aim to remove the mess by consolidating all your controls into a single unit. Going further, you can program automatic sequences of button pushes, which can turn on a specific subset of your AV gear. Many remotes also let you join multiple remotes into one, so you can control the TV and DVD player at the same time. Touch screens, favourites and custom layouts all make it easier and faster to control your gear.

Basic universal remotes have been around a long time, but are just now starting to cross into home automation. The highest tech models can connect via Wi-Fi and Bluetooth to interface with a huge number of devices. No more are remotes just for the TV — they can control lights, air conditioning, smart locks and more. Remote-control apps are also increasingly common, that can stand alone or work with existing platforms.



## AnyMote Smart TV Remote

A UNIVERSAL CONTROLLER WITH A TWIST

VERY DIFFERENT TO the competition, AnyMote is an app that turns compatible smartphones (such as some models from HTC and Samsung) into a universal remote.

There is a free (but limited) version of the app, or a paid upgrade for \$9.08, and while there are totally free apps that do a similar job, none can compete with the huge range of compatibility. The app supports over 900,000 devices, which includes everything from TVs to air conditioning units. It can also connect via Wi-Fi and control compatible devices directly, or interface with your smart home platforms. There is no limit to how many devices you can control (with the paid upgrade), and complex macros are easily programmed. The app can automate tasks, such as pausing a movie if your phone rings, and has widgets for favourite commands. It also has a floating 'chathead' style option that lets you operate the remote even when using other apps.

AnyMote is one of the most powerful, yet affordable ways to control all your devices.



## Logitech Harmony 650

POWERFUL WITHOUT BEING OVERLY COMPLEX.

A STEP UP from basic remotes, the Harmony 650 has a handy one-inch LCD that allows a much more in-depth and powerful selection choice. It's not touch-screen, though (which helps keep life simple), and navigation is performed with buttons. The screen and controls are backlit, which is pretty handy in a dark room.

The 650 is programmed via your computer (Mac or PC), and has a huge online continually updated database of codes. Macros, such as powering on everything to watch TV or just the devices needed for music, can be programmed into the remote. You can also change the mapping of individual buttons, or set icons for favourites on the LCD. The Harmony 650 can control up to eight different devices, too, from the latest TV to that old VCR in the spare room.

While the remote itself is easy to use, setup can be a little time consuming, but is well worth the effort. Keep an eye out for specials — the already cheap 650 is sometimes available for as little as \$30.

10

UNIVERSAL REMOTES ON TEST

### HOW WE TESTED

Remotes were tested on a LG TV and DVD player, Philips Hi-Fi unit and WD TV Live media player. Older device compatibility was tested with a Sony VCR. USB programming was done through Windows 10. Apps were tested using an HTC One M9 smartphone that features an inbuilt IR blaster.

### ANYMOTE SMART TV REMOTE

Approx \$9 (charged in USD)  
www.anymote.io  
CRITICAL SPECS  
Controls unlimited devices, programmable macros, Wi-Fi/Bluetooth control, automated tasks, smart home integration.



### LOGITECH HARMONY 650

\$59  
www.logitech.com

CRITICAL SPECS  
Controls eight devices, learning remote, one-inch colour LCD, macro buttons, two AA batteries.







## Logitech Harmony Elite

THE TOTAL PACKAGE

GOING BEHIND THE TV, the Harmony Elite aims to be a universal remote for your entire home. The underlying functionality is there, with the ability to control 15 devices via IR. It's also got a 2.4-inch colour LCD that recognises gestures. But the Elite also comes with a hub and taps into your Wi-Fi network. This means the remote can control a huge range of connected devices, such as Philips Hue lights and is compatible with smart home platforms such as IFTTT. The Hub itself can also output IR commands (with an extra two wired IR blasters as well) to control devices that are hidden away. The commands can all go via Wi-Fi, so control is possible from anywhere in your house. The remote also has Bluetooth, to control devices such as the Xbox One, PS4 and Wii U.

Logitech also provides an app that turns a smartphone or tablet into an extra controller. The Hub connects to the internet, meaning it's possible to check on smart home devices remotely.



### LOGITECH HARMONY ELITE

\$369  
www.logitech.com

#### CRITICAL SPECS

Controls 15 devices, Wi-Fi control and hub, smartphone app, smart home, integration, charging cradle.



## Logitech Harmony Ultimate

THE CLASSIC UNIVERSAL REMOTE TAKEN TO THE EXTREME

WANT TO CONTROL everything? The Ultimate can handle 15 different devices and has a large 2.4-inch colour touchscreen that recognises swiping and tapping gestures. Combined with vibration feedback, this makes it easy to adjust the volume or pause playback without taking your eyes off the TV.

The Ultimate is programmed from a computer, but can also learn control codes from an existing remote. It has a range of programmable options, including macros that can power up a specific sequence of devices. You can customise the screen too, with favourites and frequently used commands.

Like the Elite, the Ultimate also connects to Wi-Fi and comes with a hub that can output IR to control devices when the remote doesn't have line of sight. It also links into other smart home connected devices and platforms, and includes an app for tablet or smartphone control.

The Harmony Ultimate is also sold as a cheaper (\$180) stand-alone remote without Wi-Fi or the hub, called the One.



### LOGITECH HARMONY ULTIMATE

\$299  
www.logitech.com

#### CRITICAL SPECS

Controls 15 devices, learning remote, programmable macros, Wi-Fi hub, charging cradle.



#### [BUYER'S GUIDE]

### UNIVERSAL REMOTE

IMPORTANT FACTORS AND FEATURES TO CONSIDER WHEN BUYING A UNIVERSAL REMOTE.

#### BACKLIGHTS

Not found on the cheaper remotes, but glowing buttons are a very handy extra for dark living rooms.

#### DEVICE SUPPORT

Some remotes can go beyond AV gear and actually control other devices such as air conditioners.

#### PC NEEDED?

Basic remotes can be manually set up, but many need a computer to program in the correct codes.

#### MACROS

Good remotes allow a sequence of button pushes to be programmed together to turn on a range of devices at once.

#### UPDATES

Universal remotes can get out of date, but online databases make it possible to update the codes for new devices.

#### BATTERIES

AAs are common, but in-built rechargeables are best if the remote has a large screen or backlit keys.

#### LEARNING REMOTES

Most universal remotes can also learn codes directly from an existing controller if the model is not otherwise supported.

#### SPECIALS

Cheaper remotes (especially the Logitech models) are frequently on special and can be picked up for bargain prices.





## Jaycar Universal Remote

UPDATABLE VIA COMPUTER

FANCY-PANTS UNIVERSAL REMOTES are great and all, but sometimes you just want something cheap to use on the second TV. The problem is that the super budget variety often have out-of-date codes and don't work on all your devices. In contrast, the Jaycar remote pulls its codes from an always-updating database and loads them via USB. The downside is that it needs a PC to program it, though it is less fiddly than trialling codes direct from a remote. If you don't know the exact model of TV, it can test and search the database for you. Of course, it can also learn codes from an existing remote. The Jaycar model can handle up to six devices and has four programmable macro buttons.

The remote sits easily enough in hand and measures in at 190mm x 48mm x 20mm — pretty standard.

A bit fiddly to set up, the Jaycar remote is more versatile than other super budget options.



## Logitech Harmony 350

CAN A CHEAPER REMOTE STILL COMPETE?

A MAINSTAY OF affordable Universal Remotes, the Harmony 350 is easy to find under \$40. Unlike those cheap units that you can buy from the supermarket, the 350 loads the needed IR codes via a computer (PC or Mac). The database is constantly being updated, and supports over 270,000 different models. You can control up to eight separate devices with the remote.

The Harmony 350 includes five favourites buttons, that can be set to things like particular channels of choice, but can't handle macros. There is a Watch TV button though, which works to power on or off all your devices (and make sure they are set to the right inputs) with only a single touch. You can also learn commands from an existing remote control.

The Logitech remote sits comfortably in the hand, and while it doesn't have any fancy screens or backlighting, the shiny black case looks at home amongst higher-end gear. Setup through the computer can be a little fiddly, but the extra versatility makes up for it.



## Noontec Rii Mini

UNIVERSAL IN A DIFFERENT SORT OF WAY

THE RII CAN control your TV or other devices by IR, but it's a learning remote only. That means you need the original controller to program the Mini and it doesn't store any codes itself. On the plus side, it can handle eight different devices and 99.9% of formats out there, which, unlike most remotes, also includes air conditioners. The remote also has programmable macro buttons.

The Rii Mini is thin and easy to hold, but also has a whole host of other tricks up its digital sleeve. Flip it over and the remote has an entire QWERTY keyboard, which (coupled with the included USB dongle) lets you also control an HTPC. The unit also has an accelerometer that allows it to operate as a surprisingly good air mouse. If that wasn't enough, the Rii Mini works as a VOIP phone.

The remote has a built-in battery (charged via USB) and has a 10m range. While it's not the perfect remote, it has features no other models share.



3½

### JAYCAR UNIVERSAL REMOTE

\$29.95  
www.jaycar.com.au

#### CRITICAL SPECS

Controls six devices, IR learning, four macro buttons, USB programmable, three AAA batteries.



3½

### LOGITECH HARMONY 350

\$38  
www.logitech.com

#### CRITICAL SPECS

Controls eight devices, learning remote, five favourites buttons, watch TV button, two AA batteries.



3½

### NOONTEC RII MINI

\$79.95  
www.anyware.com.au

#### CRITICAL SPECS

Controls eight devices, learning remote, QWERTY keyboard, rechargeable battery, 156mm x 49.5mm x 10mm





## OFA Xsight Lite

WITH OPTIONS FOR THOSE WHO DON'T WANT TO PROGRAM VIA COMPUTER.

THE XSIGHT FEATURES a large, 1.4-inch colour screen that can show a range of different options and list up to 12 favourite channels by name, not number. The remote itself can control six devices at once, such as TV, DVD player and Hi-Fi. Codes are programmed in via USB, though it can also learn them directly from another remote. The software is pretty easy to use once you get used to it, and you can also program in six macro style 'activities', such as powering up just the gear needed to watch TV, or listen to music. OFA claims to have the world's most comprehensive list of remote codes, with support for over 335,000 different models. There is also the option to select the right model manually, with no computer needed.

While the LCD has a backlight, the keys don't, so the remote needs some ambient light for use.

The Xsight is a pretty big remote, but still easy enough to hold and use in one hand.



## OFA Essence 4

PART OF A LARGER RANGE OF REMOTES.

THE OFA ESSENCE 4 is the top-end device of the line-up, and can control four devices. The 3, 2 and just plain Essence models can handle three, two and one device, respectively. Pricing can vary, but it's around a \$5 saving for each drop down. The 2 and the 1 also get plain rubber buttons, not metal coated.

Aside from that, the remotes all have the same underlying functionality. Instead of connecting to a computer, the OFA remotes store the entire range of codes in the unit itself. Basic setup is pretty easy, and involves looking up the needed code online, and following the instruction to select it on the remote. You can also learn codes from an existing remote control, and set up limited macros.

For those who don't want to program via a computer, the Essence 4 is ideal, but it's still a fiddly process. It also means that the remote will get out of date, and may not support all devices.



## Philips Prestigo SRU6006

STYLISHTLY SILVER.

LIKE MOST OF its competition, the Philips remote is programmed via a PC or Mac, where you can select your device name and model number. The software is pretty easy to use (plus gets updates) and the list of supported models is fairly large. You can also use the remote to learn commands from an existing controller.

The Prestigo has a 3.8cm monochrome LCD, with a 96 x 64 pixel resolution. That doesn't sound like a lot, but it's enough to give a more in-depth control experience than just buttons alone. You can customise what options are displayed too, making it easier to get to frequently used selections. The remote can control up to six different media devices at once, but does not support AC units. It also has six programmable macro buttons, which can be used to turn on a specific sequence of devices in the living room.

The SRU6006 is a serviceable universal remote, but can't really compete with the only slightly more expensive Logitech Harmony 650.



### OFA XSIGHT LITE

\$79  
www.oneforall.com

#### CRITICAL SPECS

Controls six devices, learning remote, macro programming, four AAA batteries.



### OFA ESSENCE 4

\$59.98  
www.oneforall.com

#### CRITICAL SPECS

Controls four devices, learning remote, macro programming, four AAA batteries.



### PHILIPS PRESTIGO SRU6006

\$49.98  
www.dicksmit.com.au

#### CRITICAL SPECS

Controls six devices, 3.8cm monochrome LCD, six macro options, three AA batteries.



[FOR THE RECORD]

# Next-level TV recorders

**TODAY'S PVRs ARE MORE FEATURE-PACKED AND FLEXIBLE THAN EVER, WITH SOME EVEN PACKING BUILT-IN STREAMING FEATURES. WE TEST EIGHT OF THE LATEST.**

[BENNETT RING]

NOW THAT AUSTRALIA has transitioned to a digital TV service — and we've seen an explosion in the total number of channels — having a personal video recorder (PVR) makes more sense than ever. The likes of Netflix and Stan may be encroaching on the free-to-air market, but there's a depth and breadth of content on TV that is hard to beat considering it doesn't cost a cent. So what makes a good PVR, and how have they changed since they first showed up many years ago?

A PVR is just like the VHS recorder of the 80s and 90s, except it usually records to a computer hard drive. Some can also record to Blu-ray discs, but they're definitely in the minority. However, thanks to our digital TV transmissions, today's PVRs come with powerful electronic program guides, or EPGs. This menu shows all of the upcoming TV shows for the next few weeks, making it easy to select shows for recording. Even better, if you're a fan of a certain series, a good EPG makes recording the entire series as simple as pressing a couple of buttons, then settling in on the couch to watch the show later. Most modern PVRs have twin TV tuners, allowing you to watch one channel while recording another, or to record two separate channels. However, some also allow you to use one tuner to record two programs from the same network — for example, a single tuner can sometimes record simultaneously from both ABC1 and ABC2. This is how a quad-tuner PVR can record up to 10 programs at once.

Better PVRs also include Internet TV options, such as the various catch-up apps published by the ABC, Channel 7 and other stations.

One major new feature found on a handful of PVRs is the ability to control them remotely via your phone. When your work colleague tells you all about that amazing new show you must watch, simply fire up the PVR app on your smartphone — you'll never forget to record a show again. Some even allow you to remotely stream live and recorded TV back to your phone or computer.

One thing we learnt after testing eight PVRs is the huge gulf in usability found across various products — so read on to see which ones will do the job most effectively for you.

## HOW WE TESTED

Each PVR was connected to a 60-inch Panasonic Plasma TV, Ethernet connection (where possible) and TV antennae. We then ran the setup process, before recording several shows and testing the playback quality. We also checked to see what extra features were supported, such as Internet TV apps and external streaming, and how well they worked. Given how important usability is when it comes to PVRs, we paid special attention to how intuitive the interface of each unit was. You'd be amazed at the gulf in quality of the interface when it comes to competing PVRs, with some requiring a rocket science degree to simply set up a series record.

[BUYER'S GUIDE]

## PVRs

WHAT TO LOOK FOR WHEN BUYING A PERSONAL VIDEO RECORDER.

## EASE OF USE

The most important thing is how easy the PVR is to use. If you want to just plug in and play, go for a PVR with an understandable, clean interface. It makes all the difference between your PVR being used every day, or gathering dust after the novelty wears off.

## DRIVE SIZE

The the larger it is, the more shows you can record and keep. A 500GB will hold between 300 and 500 hours of content, depending on the quality.

## HOW MANY TUNERS?

Having multiple allows much more flexibility. If a PVR has two, you can only watch and record two channels; having four means you can watch one while recording three other channels (or even up to 10 for those that support network recording).

## APP SUPPORT

Just because a PVR has Wi-Fi or Ethernet doesn't mean it supports catch-up TV apps. Some only use this to stream videos from other devices on your network.

## TYPE OF EPG

The accuracy of the EPG is crucial for recording — the best offer online EPGs or FreeviewPlus EPGs, which are far more accurate than the basic EPG that is transmitted as part of the TV signal.

## PHYSICAL FOOTPRINT

The physical size of the unit can make the difference between it being tucked away neatly in your AV cabinet, or sticking out on top like an ugly black brick.

## REPLACEABLE DRIVES?

Hard drives are getting cheaper all the time, so the ability to swap out the PVR's hard drive for a larger unit is a nice feature.

## EXTERNAL STORAGE SUPPORT

Some units include a USB port to attach an external drive, making it easier to extend the storage space of the unit.

NAME	PRICE	HD SPACE	TUNERS	WI-FI	ETHERNET	USB	IPTV APPS	MOBILE APP	BLU-RAY
aerialBox T2200	\$369	1TB	2	Yes	Yes	2	Yes	No	No
Beyonwiz T4	\$699	500GB	4	No - dongle extra	Yes	3	Yes	Yes	No
Humax 2Tune HDR-3000T	\$449	500GB	2	Dongle included	Yes	2	Yes	Yes	No
Panasonic DMR-BWT955GL	\$748	2TB	3	Yes	Yes	2	Yes	Yes	Yes
Samsung BD-H8500A	\$449	500GB	2	Yes	Yes	1	Yes	No	Yes
Strong SRT 6500	\$399	500GB	2	No	Yes	2	No	No	Yes
Topfield TRF-2200	\$259	500GB	2	No	No	1	No	No	No
Topfield TRF-5310	\$479	500GB	2	Yes	Yes	2	No	No	No





## Panasonic DMR-BWT955GL

THE KING OF THE CROP COSTS A LOT

“YOU PAY FOR what you get!” Yes, this PVR might be almost double the cost of competing units, but it does such an outstanding job of, well, everything, that it’s justified for those with a bit more cash to spend. After spending a day with this PVR, going back to the others was a little sad.

Plugging in the unit fires up the setup wizard, which automatically downloads the latest firmware, a simple feature many PVRs lack. From here, we jumped into the gobsmackingly sexy EPG, which teaches other PVRs a lesson in usability. Eight channels are presented, with 3.5 hours of information for each, and every single line was populated with accurate data instantly. FreeviewPlus EPG support is also included. It’s also got a built-in Blu-ray recorder, for when the huge 2TB hard drive gets overly full. Panasonic claims it’ll also do 4K playback, but we didn’t have any source material to test these claims.

The included remote is clearly laid out, and even includes a Netflix button. All of the catch-up and streaming TV apps worked beautifully, with no need to download cryptically named files to get them to install. The included Wi-Fi and Ethernet options mean you can stream most everything from this box to a remotely connected device, as well as control it remotely. Did we mention how sexy the exterior looks? If you’ve got the dosh and a severe hunger for recorded TV, you can’t go wrong with this beast.

## Humax 2Tune HDR-3000T

EASY TO USE, WITH KILLER ONLINE FUNCTIONALITY

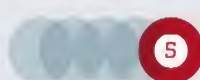
DESPITE BEING ONE of the more affordable PVRs in the roundup, we walked away rather impressed by the range of online features offered by the HDR-3000T. It’s also one of the most unique-looking units we’ve seen, with the faux leather top sitting on a relatively small box, making it easy to hide away in even the most cramped AV units.

The 500GB hard drive and twin tuners are pretty standard at this price point, though it can record up to four programmes, provided they’re not spread over more than two networks. Setup was a total cinch, with a beautiful wizard walking us through the process.

Firing up the EPG revealed an attractive if a little large menu; thanks to the large font, it only showed the next two hours for five channels. However, it’s an Internet EPG, which means it fetches info from online, making it more reliable than EPGs populated by the TV transmission, and it also supports FreeviewPlus. Making a series recording couldn’t be easier, and thanks to the online EPG, it’s also easy to fire up the various catch-up TV services that are available.

Surprisingly at this price point, this PVR supports more advanced streaming services, such as being able to stream video to an external device via the Net. It’s also possible to set recordings remotely, thanks to the iOS and Android apps.

Given the advanced online features of this device, yet how darn easy it is to use, we think it’s one of the best PVRs around.

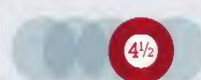


PANASONIC DMR-BWT955GL

\$748  
www.panasonic.com.au

### CRITICAL SPECS

2TB hard drive, Blu-Ray writer, three tuners, Wi-Fi, two USBs



HUMAX 2TUNE HDR-3000T

\$449  
www.humaxdigital.com

### CRITICAL SPECS

500GB hard drive, two tuners, Wi-Fi dongle included, three USBs





## Beyonwiz T4

FOUR TIMES THE FUN

WANT TO RECORD up to ten different programmes at once? You'll be needing this behemoth. With a whopping four tuners, it's got the most generous TV-gobbling capabilities of the bunch. There is a caveat to this, though — the ten programmes must be spread across four networks, such as ABC, SBS, 7 and 9. Still, it's mighty impressive stuff.

We also loved the brilliant setup guide and installation wizard. This is perfect for novices who don't want to spend hours reading the manual, as it's all spelt out clearly and concisely. This same ease of use extends to the EPG, which we reckon is one of the best on offer. It showed eight channels in three-hour snapshots, and each one was instantly populated with accurate channel info. The ease of use extends to the remote, which lacks the cryptic icons found on several of the cheaper units, and setting up a series record couldn't have been easier. Padding options of up to 120 minutes mean you won't miss the start or end of a show, no matter how little disregard the TV stations show for the EPG.

While it doesn't have Wi-Fi, the ability to record to a network drive over Ethernet is a very nice touch. However, we found the support for catch-up and streaming TV apps to be this unit's biggest downfall. They're hard to find, and out of the box only supports SBS and ABC catch-up TV, with no support for Netflix or the commercial stations. It's a real shame that this one feature lets the T4 down so much — if it came set up with the usual TV apps ready to rock, we'd make it one of the most recommended. As it is, only techies will be able to make the most of the IPTV features.



## Samsung BD-H8500A

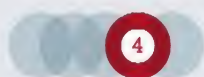
SAMSUNG NEEDS TO KEEP IT SIMPLE, STUPID.

CONSIDERING THIS PVR includes a Blu-ray writer, it's remarkably affordable, with competing units going for much higher. The 500GB hard drive mightn't be exceptional, but the ability to whack in a blank Blu-ray disc to record more is a noteworthy feature indeed.

Setup proved to be simple enough, and the main interface is attractive if a little over cluttered. Thankfully, the EPG worked first time, but it does take quite a while to load — around 20 seconds by our reckoning. Unfortunately, browsing the EPG and then figuring out how to do a series record are two very different things — even after reading the immense 77-page manual, we had to head online to decipher how to do so.

And that's arguably this unit's biggest problem — even the simplest of tasks seem needlessly complex. A huge portion of the main menu screen is taken up by a movies tab on the Smart Hub, which is apparently where you can rent and download movies from Samsung. The only problem is it doesn't work. Even after we did a full firmware update, after waiting 20 minutes for the movie page to load, we were left staring at a bunch of blank icons. Not good when it's the biggest section on the main menu. Thankfully, loading up catch-up TV apps proved to be a lot easier.

While the hardware is very respectable for this price, Samsung needs to streamline the user experience to make this unit accessible by the average couch potato.



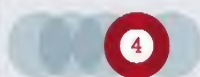
### BEYONWIZ T4

\$749

[www.beyonwiz.com.au](http://www.beyonwiz.com.au)

#### CRITICAL SPECS

500GB hard drive, four tuners, Wi-Fi dongle optional extra, three USBs



### SAMSUNG BD-H8500A

\$449

[www.samsung.com.au](http://www.samsung.com.au)

#### CRITICAL SPECS

500GB hard drive, two tuners, Wi-Fi, Blu-ray writer







## aerialBox T2200

GREAT HARDWARE AT A GREAT PRICE. PITY ABOUT THE SOFTWARE AND INTERFACE.

THIS IS ONE of the very few PVRs on the market to wear the FreeviewPlus logo. This is a service provided by the free-to-air channels that distributes an EPG via broadband, and promises to deliver a “state-of-the-art Electronic Program Guide”.

Unfortunately, we initially had major issues with the EPG on this unit. While it’s a relatively clean and simple program guide, it didn’t populate any of the channels with program data beyond an hour. Eventually, it came good, though, and we were impressed with its ability to detect when a show was running over time — most other PVRs must be set to manually “pad” the beginning and ending of a recording instead. Another nice feature is the ability to go back in time on the EPG to watch prior shows via the catch-up TV apps of each major network, albeit in all of their low-resolution glory.

The 1TB hard drive is very generous for a PVR of this price, and it also includes built-in Wi-Fi. It’s probably better aimed at those who like to dig around with their tech, as the included user manual was almost as bad as the generally ugly and clumsy interface. While the included hardware is nice, the overall user experience wasn’t up to snuff, but the ability to keep track of programme timing makes this a unique proposition. It’s got a great price too, but we’d suggest aerialBox really needs to spend time refining the interface if this thing is going to compete.



## Strong SRT 6500

THIS AGING BOX IS IN DIRE NEED OF AN UPGRADE.

AS ONE OF the cheapest PVRs in the roundup, we didn’t walk into this review thinking we’d be blown away by the Strong SRT 6500. The fact it’s also been around for over two years means it’s getting on a little bit compared to some of the new contenders. As expected, what we found was a rather simple, no-nonsense kind of PVR.

The rather lacklustre documentation that comes with this PVR isn’t helped by the fact that the official website link to download the user manual doesn’t actually work. Thankfully, it’s a very simple unit, so setting it up and using it turned out to be easy enough. The interface isn’t anything Apple would be proud of, but it does the job — even the EPG was fully populated, a nice touch that more expensive PVRs didn’t always manage. However, it appears to rely on the data transmitted with the TV signal, so won’t be as accurate as an online EPG.

The included Blu-ray player is a nice touch, especially as it’s region-free, making it one of the few available in Australia. Despite having both Ethernet and Wi-Fi, we couldn’t find any support for IPTV applications, which is a huge letdown, but points to this unit’s age. If it does support them, perhaps the manufacturer might want to make mention of them in the flimsy manual or woeful website. While this unit covers the basics well, the fact is... there are far better, more modern options around for a similar cost.



**AERIALBOX T2200**  
\$369  
[www.aerialbox.com.au](http://www.aerialbox.com.au)

**CRITICAL SPECS**  
1TB hard drive, two tuners, Wi-Fi, two USBs



**STRONG SRT 6500**  
\$399  
[www.strong.com.au](http://www.strong.com.au)

**CRITICAL SPECS**  
500GB, two tuners, two USBs, Blu-ray player (region free)





## Topfield TRF 5310

TOPFIELD'S SOLID RECORDING ABILITY IS LET DOWN BY A LACK OF IPTV SERVICES.

TOPFIELD IS ONE of the most recognised brands of PVR in Australia, but we have to say that, these days, their dominance here is being severely challenged. At close to \$500 for a twin tuner, 500GB PVR, the 5310 isn't quite as good value as it used to be, especially when compared to the likes of the Humax 2Tune which does so much more for a whole lot less.

Before we dig into its IPTV features, we should give the EPG some praise. It's one of the fastest to load, though it doesn't support the FreeviewPlus guide, which means it could be prone to inaccuracies. We also found that a couple of key channels weren't populated with data, such as Channel Nine. At least it's very easy to use, and figuring out series recording and how to pad each recording is very simple.

Despite including Wi-Fi and Ethernet, the online options of the TRF 5310 are extremely limited. There's absolutely no support for catch-up TV or streaming TV options; heading into the Web Apps section simply reveals YouTube, Facebook and a bunch of other sites that are tedious to browse on your TV.

As a result, when compared against the likes of the Humax 2Tune, the 5310 simply fails to stack up.



## Topfield TRF 2200

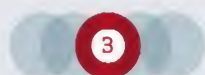
IT DOESN'T GET MUCH CHEAPER THAN THIS, FOR GOOD REASON.

WELCOME TO BUDGET town. Population: the TRF-2200. At just over \$250, PVRs don't get much cheaper than this. As previously stated, Topfield is one of the biggest names in PVRs in Australia, so we were very keen to see just how much — or little — they'd deliver on a budget.

To be brutally honest, all this thing can do is record two channels thanks to its twin tuners (not multiple programmes over the same network though), and we wouldn't rely on its EPG to do a very good job of it. There's absolutely no Internet connectivity on this thing, so you'll be relying on the accuracy of the transmitted program data, which any PVR veteran will warn you is not something to be trusted. The flimsy six-page manual does a horrid job of explaining the cryptically labelled remote control, though we did eventually figure out how to do a series record after much trial and error.

Thanks to the lack of Ethernet or Wi-Fi, updating the firmware is a pain in the posterior, and there's no way to stream recordings to other devices in the house. There's also obviously no IPTV services.

There's no denying just how damned cheap this thing is, and yet we can't recommend saving a few bucks to get such a limited device that probably won't even do a good job at recording.



### TOPFIELD TRF 5310

\$479  
www.topfield.com.au

CRITICAL SPECS  
500GB; two Tuners, Wi-Fi, three USBs



### TOPFIELD TRF 2200

\$259  
www.topfield.com.au

CRITICAL SPECS  
500GB hard drive, two tuners, one USB







[TURNITUP]

# Upgrade your TV's sound

LET'S FACE IT: THE SPEAKERS INSIDE OUR UBER-FLATSCREEN TVS AREN'T GREAT. A SOUNDBAR CAN MAKE ALL THE DIFFERENCE, SO THIS MONTH, WE'VE TESTED EIGHT.

[SHAUN PRESCOTT]

TELEVISIONS HAVE COME a long way since the days when they were huge, cumbersome boxes taking up precious floor space in your living room. They're getting wider and thinner, with displays more vibrant and crisp, but as the visual aspects have improved, sound has tended to decline. You could lay the blame for this squarely on the same reason displays are getting better: there just isn't room to put in high-quality speakers. If you want an ultra-skinny and extra-large display, where are the speakers meant to hide?

Soundbars are the cheapest and most convenient way to compensate for the dreary sonic fidelity of modern screens. While busy-bodies, audiophiles and people looking for an authentic theatre experience are better off cherry-picking the separate components for themselves, soundbars are for folk who want a simple, easy-to-install alternative with high-quality playback. It helps that soundbars also serve several purposes. While designed primarily for your television, most support Bluetooth and Wi-Fi, meaning you can stream music from your phone, tablet or laptop. Some even boast multi-speaker functionality, allowing you to connect several speakers throughout a home to the same output, providing you're keen to fork out for the extra speakers. No more waiting in the lounge room for that *Living on a Prayer* key change: you'll hear it just as well in the kitchen. Oh, and if you have your television bracketed to the wall, don't worry — most soundbar models are designed to do the same.

It's not all smooth sailing, though, and before you throw this magazine down and sprint to your electronics store, there are a few things to keep in mind. For one: the market is saturated and prices tend to vary dramatically. Meanwhile, it can be a bit hard to determine whether any given model is right for your television. Over the next couple of pages, we'll review some of the standout models on the market, and also offer some tips and must-knows if you're looking to purchase one of these bad boys.

[BUYER'S GUIDE]

## TV SOUNDBARS

WHAT YOU NEED TO KNOW WHEN BUYING A SOUNDBAR FOR YOUR TV.

### HDMI PASSTHROUGH SUPPORT

If you plan to connect a soundbar to your TV via HDMI, make sure your TV is ARC compatible. Most TVs with ARC HDMI have it clearly marked near the ports, but double check before purchasing. If your TV's HDMI port isn't compatible, optical or coaxial connections are usually an option.

### WILL IT FIT?

It may seem like common sense, but be wary of dimensions. If you plan to lay your soundbar in front of the TV, will it obscure the screen? Will it be too wide for your cabinet? Will it fit on the wall?

### BLUETOOTH CONNECTIVITY

While Bluetooth is a stock standard feature in most modern soundbars, do double check, and don't bother purchasing a soundbar without it.

### TYPE

Soundbars come in two typical designs: traditional and pedestal. The former is most common and resembles, funnily enough, a long tubular bar. The latter resembles a plank and sits beneath your TV.

08

SOUNDBARS  
ON TEST

### HOW WE TESTED

We tested each product using both HDMI and Bluetooth where possible, as well as optical connections. Each was exposed to a range of music spanning genres techno through to folk, and we used video-on-demand service Stan to test the speakers' cinematic prowess.





## Panasonic SC-ALL70T

THE AFFORDABLE ALL-ROUNDER.

THIS UNIT IS **relatively stripped back and easy to use**, befitting its price tag. We had it **working within minutes of opening the box**, as its Bluetooth compatibility is **straightforward** — pair the subwoofer with the soundbar, and then pair the soundbar with a Bluetooth compatible television or other device. **There are HDMI-in ports** as well, but the lack of wires (save for the AC adapters) is what makes this unit attractive at this price.

You get three speakers inside the 95cm-wide soundbar, pumping out 350watts combined with the 16cm wireless sub, which can be moved at will, though it does need an AC power cable. The output is balanced and satisfactorily clear, though be careful not to situate that subwoofer too close to the bar itself because it's liable to muddy whatever dialogue is running through the main speakers.

Aesthetically, the SC-ALL70T is discreet and unassuming, whether situated in front of a television or bolted to a wall. As for the woofer, its not the prettiest black block you've ever seen but given the speaker points downwards, you can hide it behind the ferns and not obscure its output.

With 5.1 Surround support and the ability to connect several speakers at once, it's hard to pass this device up, though you can pay \$150 dollars less for the next model down.



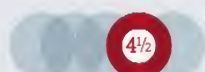
## Panasonic SC-HTB690

STRIPPED BACK, BUT PLENTY OF HEADROOM.

THE SC-HTB690 IS basically the same as Panasonic's more pricey SC-ALL70T, though this model — for around \$150 cheaper — lacks 5.1 Surround and multi-speaker functionality. For those very keen on surround sound, a soundbar might not be the best option available (though the SC-ALL70T does it well as far as soundbars go) and multi-speaker functionality... well, it depends whether you own compatible Panasonic speakers. It also depends on how much full-house audio means to you. If either of these are crucial for your wellbeing then don't bother reading further.

This model shouldn't be defined by what it lacks, though, because the SC-HTB690 otherwise features all of the benefits of its more expensive sibling. The sound is crisp, balanced and vibrant, while the options for connecting to it is abundant: HDMI, optical and Bluetooth are in, and of all the soundbars we tested, the Panasonic models caused the least grief setting up. It also features 4K passthrough and a downward-facing sub speaker, which has the added benefit of emitting a faint rumble during particularly action-packed cinematic scenes (unless you've got it hidden behind the ferns).

If you need a budget soundbar setup, there really isn't a better option than this, and \$600 seems remarkably cheap for the performance you get.



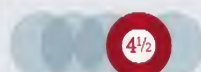
PANASONIC SC-ALL70T

\$749

[www.panasonic.com/au](http://www.panasonic.com/au)

### CRITICAL SPECS

Three 70w in bar, one 140w in subwoofer;  
HDMI, Optical, Analog, Bluetooth; Dolby  
Digital, Dolby Virtual Speaker, DTS Digital  
Surround; wall-mountable



PANASONIC SC-HTB690

\$599

[www.panasonic.com/au](http://www.panasonic.com/au)

### CRITICAL SPECS

Three 70w in bar, one 140w in subwoofer;  
HDMI, Optical, Bluetooth; LPCM, Dolby Digital,  
DTS Digital Surround; wall-mountable







## Denon DHT-S514

JAPANESE COMPANY REIGNS IN CLARITY STAKES

COMING IN AT half-a-grand less than the Heos HomeCinema system, the Denon DHT-S514 is likely to do everything you need if you just want better quality audio for your television. The wide soundbar (it's a smidgeon over a metre long) has six speakers in it, while the wireless 49-watt subwoofer boasts two drivers and a bass port.

The DHT-S514 boasts one HDMI port, optical and coaxial inputs and Bluetooth functionality. It carries Denon's own Virtual Surround, which offers several audio settings you can tweak to perfection. It has no LED display, but using the small, credit card-sized remote control, you can use lights on the soundbar as a guide — though you'll need to remember what each colour means.

In terms of output, we had good results across the board. The DHT-S514 strikes a nice balance between clear, trebly top ends and well-rounded, static-free bass. Whereas cheaper soundbars generally have a weak point between either of those extremes, Denon seems to have mastered the balance in this space — though you'll need to use common sense when it comes to coordinating volume between the subwoofer and the soundbar itself, especially given how powerful the DHT-S514's bass can sound. War films will sound especially devastating through this configuration.



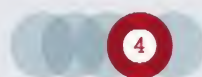
## Denon Heos HomeCinema

PREMIUM SOUNDBAR TECHNOLOGY WITH MULTI-SPEAKER SUPPORT

THE HEOS HOMECINEMA comes with all of the elements you'd expect from a soundbar in this price range. It has six speakers in the soundbar itself (two 5-inch drivers and two dome tweeters) and two drivers in the subwoofer. That subwoofer, by the way, packs a real punch. We listened to some aggressive German techno through that thing and it didn't threaten to clip. Likewise, streaming *Better Call Saul* on Stan provided a cinematic experience you just don't expect from a video-on-demand stream.

HDMI is the best way to connect up, but there's also optical and coaxial, and you can even plug your phone straight into its 3.5mm input. It has multi-room functionality controlled by a special Heos app, which you can use to access your Spotify or Tidal account on other Heos speakers in your house. Or you could have your television audio playing in the kitchen, or the bathroom, where it'd come especially in handy during the cricket. Virtual Surround is supported, and there's plenty of opportunity to tweak the sound settings with a Dialog Enhancer mode.

You might balk at the price tag — and the Heos HomeCinema lacks the ultra-thin gimmickry of the similarly priced Harman / Kardon Sabre — but this setup is a true workhorse.

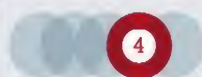


### DENON DHT-S514

\$999  
au.denon.com/au

#### CRITICAL SPECS

Two 0.5-inch tweeters and two oval 2-inch and 5-inch mid chassis in soundbar, two 5.25-inch in subwoofer; Optical, HDMI, Coaxial, Aux; Dolby Digital, Dolby Digital Plus, DTS; wall-mountable



### DENON HEOS HOMECINEMA

\$1,500  
au.denon.com/au

#### CRITICAL SPECS

Two bi-amplified mid-woofers and two soft dome tweeters in soundbar; Optical, HDMI, Coaxial, Aux; Dolby Digital, Dolby Digital Plus, DTS; wall-mountable







## Sony HT-NT3

STYLE WITH NO LACK OF SUBSTANCE

PRICEWISE, THIS MODEL sits firmly in the middle of Sony's range, but compared to similarly priced competitors, it feels quite premium. This 2.1 channel, 400-watt soundbar and subwoofer combo supports Sony's own hi-res audio. That probably won't mean much if you're in the market for a soundbar (true audiophiles would never deign to choose the easy option) but if you believe the hype, it's sure to be a boon. It's also HDCP 2.2 compatible so 4K playthrough is possible.

The HT-NT3 is wider than a lot of its competitors at 1.7 metres, so if you plan to have it rest in front of your television, make sure your television is big (or else wall mount it, though that hardware isn't available in the box). When it comes to clarity, the HT-NT3 is remarkable — bass feels subterranean, yet defined, and higher frequencies sparkle — but we had some trouble actually getting the device to pair with some Bluetooth devices. It comes packed with a remote control that can scroll through a variety of channels (including three separate HDMI) but it's quite annoying to use, thanks to button latency.

Still, that's a pedantic criticism for what is otherwise a very attractive package. It's also more aesthetically pleasing than most of its competition, if that matters to you.



## Harman / Kardon Sabre SB35CNTR and SB35SUB

MINIMALIST DESIGN HAMPERS TONE

THE SB35 BOASTS some of the most impressive industrial design we've encountered in this space: the soundbar is extraordinarily thin, and the subwoofer is a wall-mountable 9cm — a far cry from the big black boxes most units ship with. One drawback is the soundbar has to be wall-mounted, ie, it won't sit in front of your television like most of the competition.

Meanwhile, the SB35 offers all the connectivity you'd expect at this price range: optical, analog, HDMI and Bluetooth. HDMI worked well for us, but do keep in mind that the soundbar only has mini-HDMI ports, and only one cord in the box.

Unfortunately, the slick size of the SB35 is its best quality. We had no problem getting good results from an HDMI connection in a home cinema environment: all the requisite clarity is present, the bass sounds like liquid molten at high volumes and the midrange sparkles. That is, until you try to turn it up too high — the SB35 starts to clip far too early for a setup this expensive. We suspect it's the size of the speaker boxes at fault, or maybe that the SB35 provides a little too much leeway with its volume control, as it does seem to get louder than most of its competition but it doesn't seem capable of those volumes. If you're happy to pay a premium for great design, and don't want loud playback, the Sabre SB35 is a neat package.



### SONY HT-NT3

\$899  
www.sony.com.au

#### CRITICAL SPECS

One subwoofer driver, four soundbar drivers; HDMI, Bluetooth, Optical; Dolby Digital, DTS, Dolby True HD; wall-mountable



### HARMAN / KARDON SABRE SB35CNTR AND SB35SUB

\$1,699  
www.harmankardon.com

#### CRITICAL SPECS

Five 45mm midrange transducers and four 25mm high-frequency transducers in soundbar, two 112mm transducer in sub; Optical, Analog, HDMI, Bluetooth; Surround Mode, Dolby Digital, DTS; wall-mountable





## JBL Cinema SB350

LOOKS GOOD, SOUNDS AVERAGE

AFTER HALF AN hour spent trying to pair the subwoofer to the soundbar (I needed to 'reboot' the soundbar, naturally), the SB350 delivered reasonable but unremarkable playback. There are six speakers tucked away in the one-metre-long soundbar and two in the subwoofer, and while the 2.1 channel, 320-watt output can't compete with the Panasonic SC-ALL70T in this price range, it's an undeniably satisfying sound for movie playback. For Bluetooth music playback, we found that we needed to fiddle around a bit — both with subwoofer placement and the mixers on our smartphone — to get the SB350 to sound satisfactory. While it supports wireless music playback, this was definitely designed with television and home cinema playback in mind. It's equipped with Virtual Surround, which isn't 'true' surround sound but it does a decent job of approximating that effect.

You'll control the SB350 with a remote control, which allows switching between Bluetooth, HDMI, Auxillary and Optical. The unit is attractive enough, and its semi-tubular shape unlikely to contrast too dramatically from whichever television you're using — assuming you don't wall mount it, which is an option here. There's no denying the SB350 is a decent product at this price, but with competitors delivering better performance at a smidgeon above the circa-\$700 street price, it's a little tough to recommend.



## Bose Solo 15

UNFASHIONABLE AND ALREADY OUTDATED

SOUNDBARS ARE MEANT to be an easy option, but **what if** you want an even easier option? The Bose Solo 15 is probably **as simple** as you'll find, as it lacks an external subwoofer, doesn't have any fancy HDMI connectivity, and pretty much only supports optical, analog and coaxial connections. Lack of HDMI will be damning for some, but we found the Solo 15 most useful as a Bluetooth speaker, and that's naturally only going to be useful if you have a Bluetooth-capable TV.

There's no denying the Solo 15 lacks the class of more streamlined, discreet soundbars. This, after all, is a huge flat box slotted beneath your television (assuming your television isn't too big: it only supports screens "up to 46-inches and some up to 50"). Oh, and the remote control is hilariously massive — though it is universal. Don't buy this if you're into minimalist interior design. Even when a TV is placed on top of this device, it stands out like a sore thumb.

It's hard to recommend the Solo 15 to anyone. The low-end Panasonic soundbar is much classier, boasts HDMI compatibility and sounds good, at only \$50 more. We experienced some rattle with particularly deep bass frequencies, and while you're unlikely to stress this speaker too much with cinematic presentations, listening to high tempo, bass-oriented techno at high volumes wasn't satisfactory at all. Unless you can get this at a rock bottom price, there's little to recommend it.



3

JBL CINEMA SB350

\$700  
www.jbl.com

### CRITICAL SPECS

2x2 55mm drivers, 2x2 32mm dome tweeter, one 165mm driver in subwoofer; HDMI, Optical, Analog, Bluetooth; Dolby Digital, Harman Display Surround; wall-mountable



2½

BOSE SOLO 15

\$549  
www.bose.com

### CRITICAL SPECS

Optical, Coaxial, Bluetooth, RCA; shelf-mountable



[ HOW-TO ]

# Create the ultimate DIY streaming setup

**PLEX CAN STREAM ALL OF YOUR MOVIES AND MUSIC ACROSS THE HOUSE, AND TO YOUR MOBILE.**

[ SIMON CHESTER ]



LONE GONE ARE the days where a house would only have a single TV — it's now quite common for households to have TVs not only in lounge rooms, but also bedrooms, kitchens, even bathrooms (maybe... I'll get back to you on that one). Similarly, there are now more and more stereos and Hi-Fis in houses, too. And as nobody uses physical media anymore (disclaimer: I still buy vinyl, not because it sounds better — it doesn't — but because it's fun and beautiful), it makes sense to store all of your digital content in a single place and just stream all of it to the various TVs and stereos across the home and beyond.

Indeed, with decent broadband now commonplace (well, fairly commonplace... *\*shakes fist at NBN\**), there's no real difference

between streaming your content to your screens and speakers throughout the home, and streaming it to the screen and speakers of your smartphone — no matter where you are in the world.

In fact, there's a really simple solution that will allow you to do all of this:

## PLEX

Plex is a freemium software-meets-Internet service that organises and distributes your music, movies, TV shows and pictures out to just about any device you own, whether it's your HTPC (home theatre PC), gaming console, smartphone or something else entirely.

Tell me more...

The features I love most about Plex are its smart media management and ease of setup and use. Point Plex towards your media library and it will download a tonne of extra metadata, including movie posters, synopses, genres, cast and crew info etc. for your movies and TV shows, and album art, genres, album reviews, artist bios, popular tracks, music videos etc. for your music. It then presents this information to you in a beautiful and logical interface that works from your web browser or any number of apps designed for different platforms, including Android, iOS, Windows Phone, Xbox, PlayStation, Roku, AppleTV, Raspberry Pi and more.

Better yet, it keeps a log of all the movies and TV shows that you've watched, and keeps



this in-sync between devices — even up to the moment where you last hit stop on that show. This makes it a cinch to change rooms when a movie is interrupted, or for you to start watching something while you get ready in the morning, then switch to your mobile device to finish it while you sit on the bus.

Plex can also bring in some of the best content from around the web through its ‘Channels’, which can be accessed (and added) through the main navigation pane on the left-hand side of the Plex web interface. What makes this feature extra great is that Plex supports third-party ‘unofficial’ Channels that can bring in slightly more obscure web content (including some legally dubious content, too), making your installation of Plex sort of like Netflix, but cheaper and illegal.

Indeed, Plex is stuffed with so many features that it’s quite difficult to talk about them all in any detail, but some of my favourites include:

**On Deck:** a handy feature built into Plex’s UI where it shows any movies, episodes or series that you’re in the middle of watching. All of this is shown on the front screen of Plex, making your most relevant content always at the ready.

**Watch Later:** Plex can create a queue of videos that you found online, but thought should wait for a better moment or bigger screen. To add videos to your Watch Later queue, simply send an email containing the URL(s) to a special email address, or press a special bookmarklet in your browser (to find your email address and bookmarklet, visit the Watch Later queue page in Plex).

For a list of supported video sites, visit: [tinyurl.com/tla46-plex](http://tinyurl.com/tla46-plex).

**Share:** If you’re feeling generous, you can share any and all of your Libraries to friends — simply enter their email address or Plex username. You can choose which Libraries to share, as well as define access restrictions (such as movie ratings or media labels) and if you want to include your channels, or restrict other features like camera uploads from mobile devices (yep, you can sync your mobile photos, too) or offline media sync for mobile devices (also that).

**Trailers (including ‘pre-roll’):** one neat little feature is the option to show ‘pre-roll’ trailers before any film you watch, just like in the movies (no choc tops included). You can choose to include trailers for movies in your collection, for movies just coming out on Blu-ray/DVD, or those just coming to cinemas (see Settings > Web > Player). Additionally, when you’re browsing your collection, you can also view a trailer for almost any film in there, which can sometimes help answer the

often-posed question: “Why on Earth did I download this?”

**DLNA:** if you have a device that doesn’t explicitly support a Plex app for playback, you can access any of Plex’s content through a DLNA client. See Settings > Server > DLNA to enable, or [tinyurl.com/tla46-dlna](http://tinyurl.com/tla46-dlna) for support.

### FREEMIUM — ONLY MOSTLY FREE

Now, if your wallet tingled in your pocket when I mentioned the term ‘freemium’, you should know that, while most of Plex’s features are available in the free version, there are some extras for those that opt for a subscription, known as a Plex Pass. The free features, however, are still plentiful, and include: the beautiful interface for selecting and watching your media; the ability to watch/listen to that media on different devices, including Chromecast, Apple TV and Roku (while mobile apps are free for subscribers, they can be purchased separately to a Plex Pass, albeit with some restrictions, see [tinyurl.com/tla46-plapps](http://tinyurl.com/tla46-plapps)); Channels; and the Watch Later queue.

If you opt for a Plex Pass subscription, you will additionally net free access to all the Plex apps (no need to purchase them separately), which allow you to stream or download your media to your mobile device (Android, iOS, Windows Phone), or view it on your (compatible) Smart TV, PlayStation, Xbox or Android TV. You also gain Cloud storage (such as Dropbox) upload of your media, so that you can access it when your home PC is turned off; and the ability to create a hierarchy of users in your household, each with their own libraries, watched/unwatched lists, and defined access restrictions, such as no R-rated films for the kids.

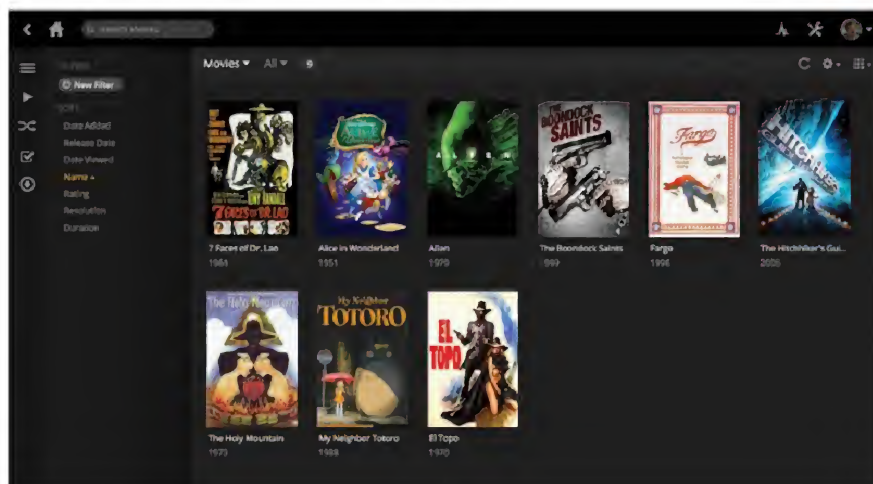
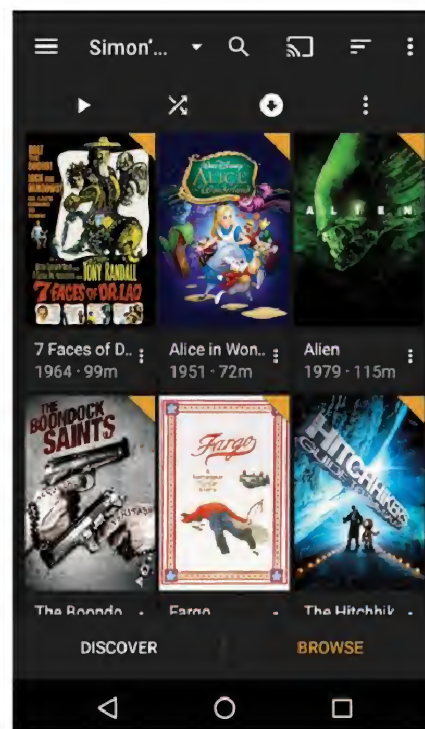
Also, as an administrator of the home, you can monitor what any user is watching or listening to. You can learn more about

multi-user setups at [tinyurl.com/tla46-phome](http://tinyurl.com/tla46-phome).

How much will all of this cost? A Plex Pass subscription can be purchased month-to-month for US\$4.99 (less than Netflix), yearly for US\$39.99, or a once-off lifetime membership for US\$149.99, which presents the best value if you’re confident that you’ll use the service for more than three years.

### SETTING IT UP

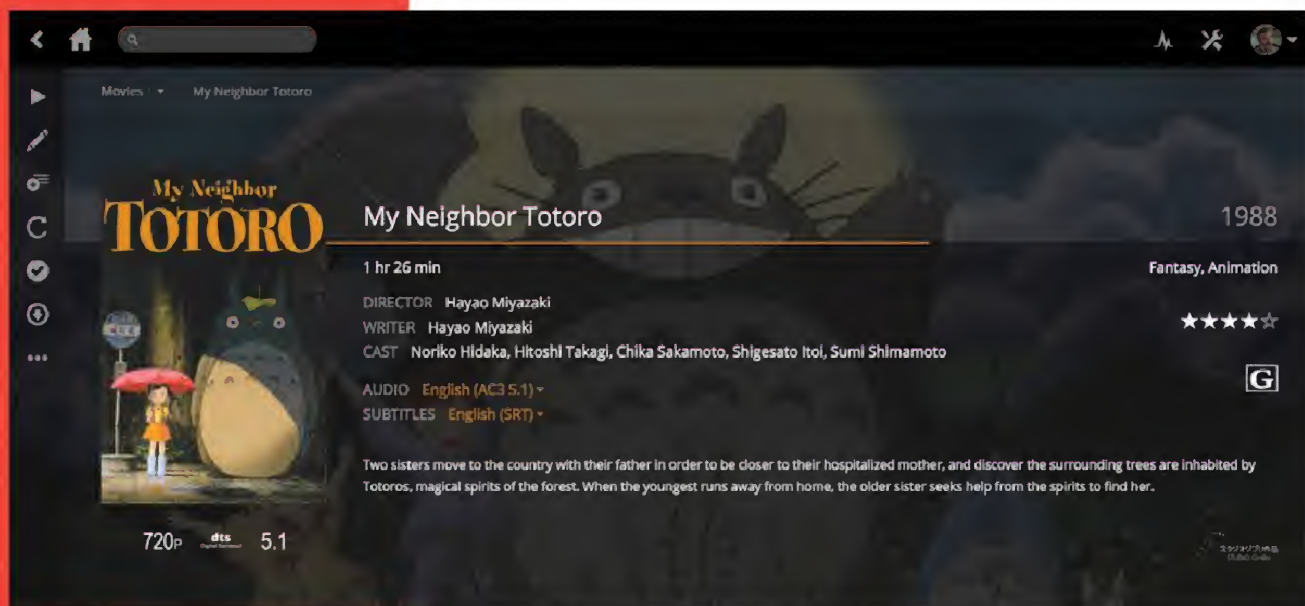
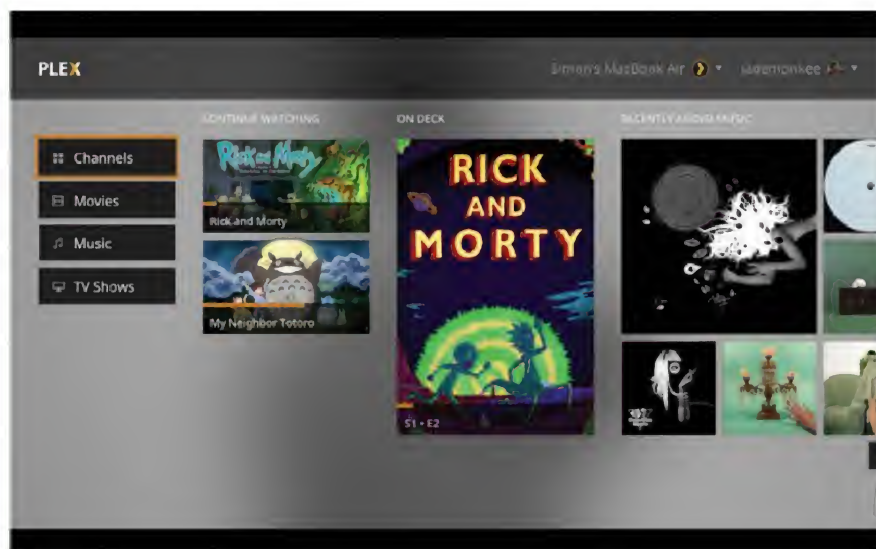
The first thing to do before opting for a Plex install is to figure out how many of your TV/stereo-connected devices it can run on (I say stereo, as they don’t necessarily need a screen, too). So visit [tinyurl.com/tla46-plapps](http://tinyurl.com/tla46-plapps) and take a look at the list of the different Plex apps (those that connect to Plex Media Server to





### THERE'S KODI, TOO...

Now, Plex isn't the only solution for streaming content around and out of the home, but it's my favourite because it's the most painless. The most notable of its competitors is Kodi (formerly XBMC or Xbox Media Centre), of which Plex was actually spawned from. Notably, just about everything you can do on Plex can be done for free on Kodi, but it takes some time to set up, configure and troubleshoot. I prefer the more polished feel of Plex but, if you're a power geek, you can mimic almost all of Plex's features without paying a cent. In fact, if you already have Kodi installed and set up, it's actually possible to have Plex running side-by-side with it, and even be able to access it from within Kodi itself, giving you the best of both worlds. To learn how, see [tinyurl.com/tla46-kodi](http://tinyurl.com/tla46-kodi).



### PROBLEMS?

The team at Plex have put together some of the most accessible and thorough documentation I've seen, so if you have an issue, you'll probably find an answer to it at: <https://support.plex.tv>.

### WATCHING TV

Despite the plethora of features I've just described, one notable absentee is good ol' TV viewing. Well, next month, I'll cover some additional software that can work as a PVR in tandem with Plex.

deliver content), and see if it'll work for you. Perhaps worth noting is that you can add a cheap Chromecast or Raspberry Pi (running Plex Media Player or RasPlex) to bring Plex to any screens that don't currently have a supported device connected.

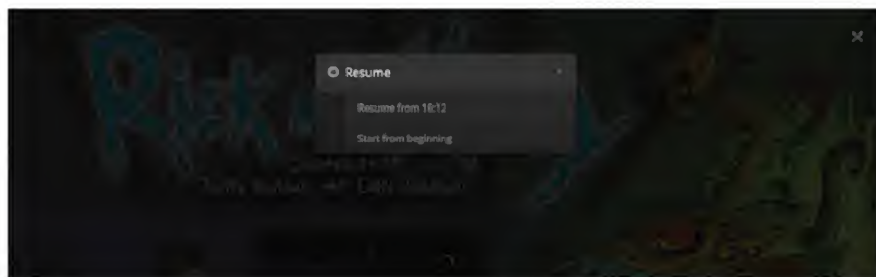
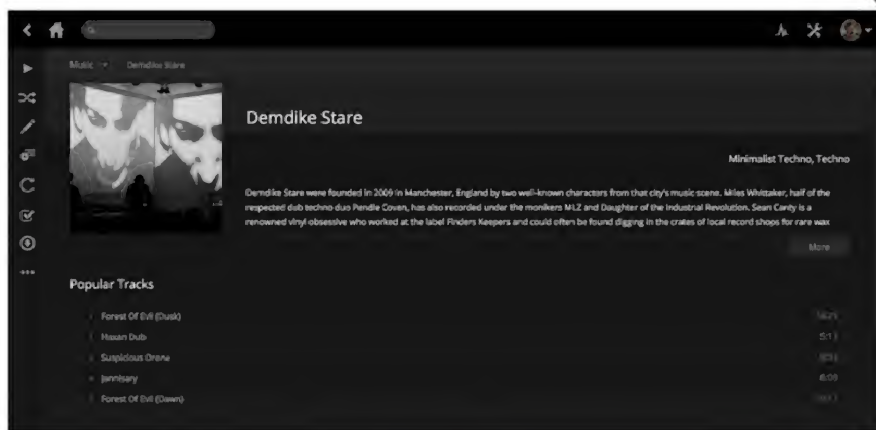
Now that you have some compatible devices, let's get Plex running in your house. For Plex to work, you need to install the Plex Media Server software on the computer (or NAS) that stores all your audio and videos. Plex Media Server is the software that downloads all the metadata for your music, movies and TV shows, provides the neat web interface for you to browse them and transcodes the content in case it isn't in a suitable format for the device you're viewing it on.

As you can access all of your media from a web browser, Plex Media Server doesn't need

to be installed on the PC that you will be viewing it from, but it can be if you want.

Plex Media Server can run on just about every platform out there, including Windows, Mac, Linux (ready-made for Ubuntu, Fedora, CentOS) and even FreeBSD. It's also available for many Network Attached Storage (NAS) devices, including ones from Synology, Netgear, QNAP, unRAID, Drobo, Asustor, Thecus, Seagate, and WD — note, though, that performance on most NAS devices, particularly when watching more than one stream, can be frustrating. As such, you're almost always better off installing Plex on a proper computer. It need not be the latest and greatest, but you will want a semi-capable CPU (my seven-year-old Intel i7 works fine, even when transcoding HD). To see how capable a PC you may need, visit [tinyurl.com/tla46-system](http://tinyurl.com/tla46-system).





Speaking of requirements, this also leads me to the point of storage: if you can, store your movies and TV shows on fast ‘spinning disk’ (SSD is overkill) drives — so called ‘green drives’ may introduce stuttering and excessive buffering when seeking in videos, particularly if there’s more than one device streaming content. Also, don’t store your media on a computer other than the one you’ve installed Plex on; you’ll hit the network twice when watching if you do, which will only end in heartache.

If you can, you’ll also benefit from installing Plex on (or moving its storage folder to) an SSD drive. Doing so will greatly speed up the browsing of your extensive collection, particularly when you’re tearing down a long list of movie posters trying to find that one movie you can’t remember the name of.

And, finally, your server should have a wired connection to your network, preferably a gigabit one — avoid Wi-Fi like the plague. If at all possible, you’re also better off using wired connections for any of the Plex clients (those that you will be watching media on), too, but it’s not as crucial a requirement, as you can always drop the quality if you run into streaming issues.

Now, while Plex’s metadata scanner is pretty forgiving, there are some basic requirements that your media should meet (mainly clearly labelled folders). To get an idea of how your media should best be organised, I really recommend reading the information at [tinyurl.com/tla46-media](http://tinyurl.com/tla46-media).

Now that you have your server sorted, head over to [plex.tv/downloads](http://plex.tv/downloads) to grab the correct version for your operating system.

While that’s downloading, start a Plex account by pressing the orange “sign up”

button up the top right of the Plex.tv website. Make sure that you activate your account (by pressing the link in the email they’ll send you) before installing the software, as it’ll cause issues if you don’t.

Once you’ve activated your account, install the server following the on-screen instructions. After installation completes, you’ll be redirected to the Plex interface in

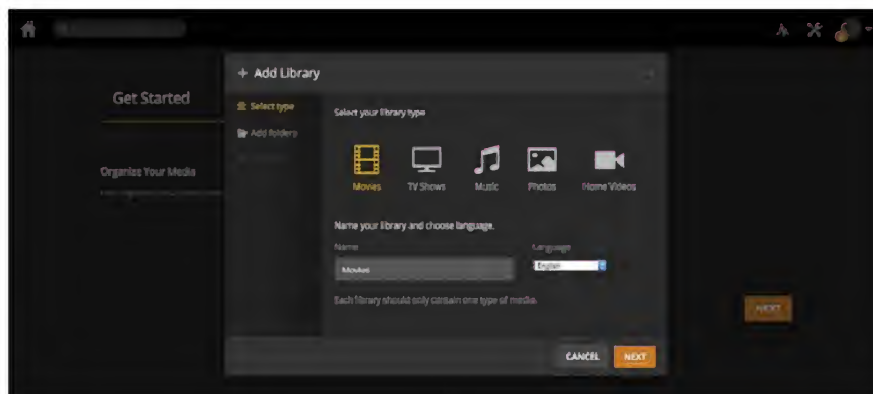
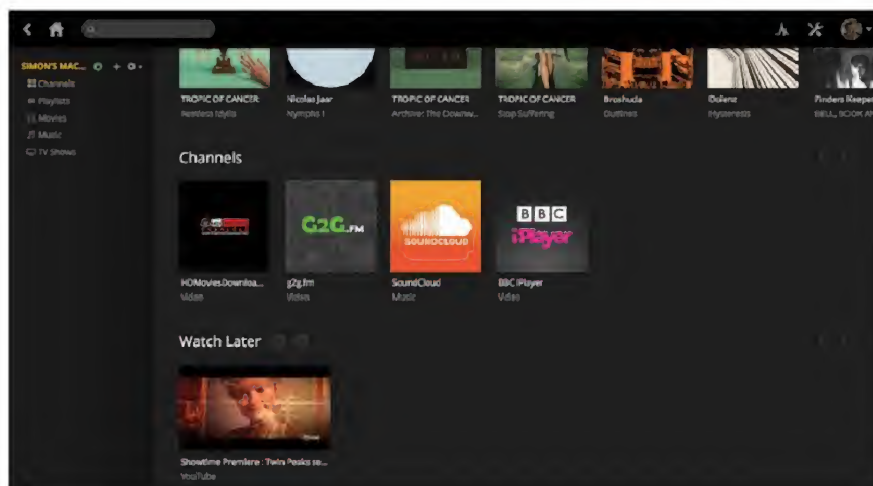
your browser — [plex.tv/web](http://plex.tv/web) (despite the URL, it’s actually running from your Plex Media Server, not Plex’s website). This is the main point of interaction for Plex — you use this web interface to manage settings, browse your library, and even watch/listen to content on computers (unless you install the optional Windows 8/10 app, Plex Home Theatre, or its replacement, Plex Media Player, for HTPCs).

The setup wizard is pretty self-explanatory, but you may benefit from a bit of info on the terminologies used, in particular the concept of ‘Libraries’. You will have one library per media type, that is, one each for movies, TV shows, music, photos and home videos.

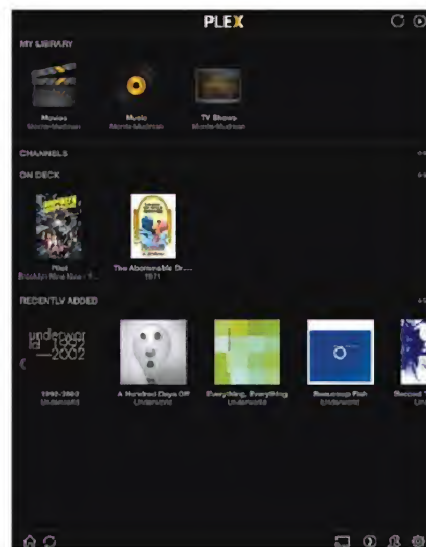
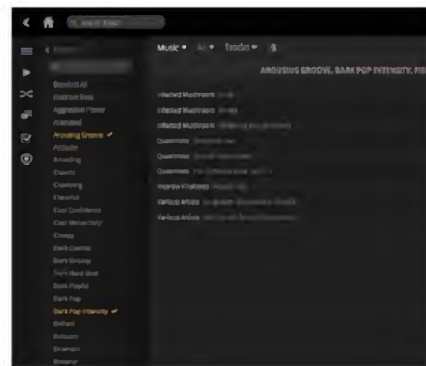
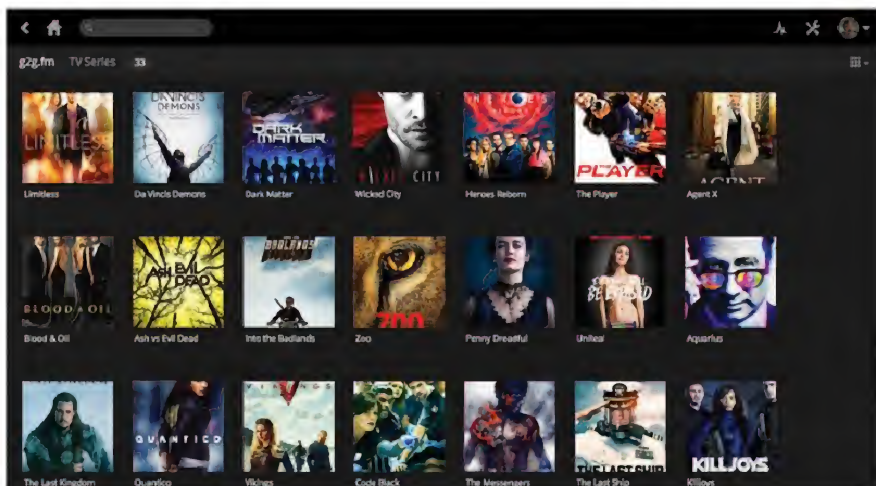
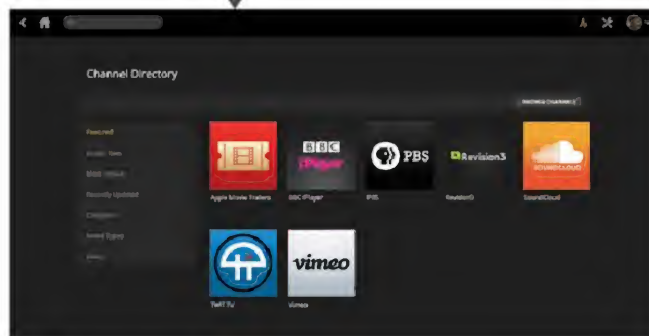
There’s no limit to how many Libraries you can have, so if you want to separate out your movies/music from your partner’s, then just add one Library each and name them accordingly. Similarly, you can also combine different directories into a single Library, so if you have movies spread across several hard drives, just add multiple folders/locations when creating your movie Library.

Once you’ve added a Library, Plex will start scanning its contents and downloading the extra metadata from the Net.

When adding a music Library, you’ll see an option to create a Premium Music Library







(available to Plex Pass subscribers only). This will additionally download enhanced metadata for your music, including artist bios, album reviews, links to ad-free music videos and more. It also allows you to create a Plex Mix that will create a mix of music similar to a track in your library (similar to Spotify radio or Pandora), as well as mood-based dynamic playlists.

These mood-based playlists are possible thanks to integration with the Gracenote music database, which brings down appropriate genre and mood tags for all of your music. To create one, simply press the three stripe options button from the Music view, change the view to Tracks, then press New Filter and choose any moods or genres that you want to compile. You can play it now, or save it as a playlist for later access. If saved as a playlist, it will automatically add any new music to your Library that also fits into the specified moods or genres. Neat!

### EXPANDING FUNCTIONALITY THROUGH CHANNELS

As mentioned earlier, you can add online content to Plex by visiting the Channels section, then choosing the Install Channels button. Channels collect content from across the web, including video (such as TED talks or TWiT.tv) and music streaming services (such as Soundcloud). It's worth pointing out here

that Channels don't yet work on every device, notably not the PlayStation or Xbox apps, although support is coming soon. On the surface, Channels don't seem terribly extraordinary — that is, until you start browsing through some of the the third-party unofficial channels.

As I mentioned earlier, unofficial channels can pull down content from just about any website out there for playback through Plex. As these are created by users, and not Plex itself, they are barely regulated, so can contain

content from some of the legally dubious video sites out there, which is great news for pirates.

There used to be a sort of app store for these unofficial

channels, which would allow you to browse and install them from within Plex, but it's been out of action since last January. However, this doesn't prevent you from searching for and installing the channels yourself: installing them is just a matter of downloading a zip file and extracting its content to the Plex Plug-ins folder. You can learn more about unsupported channels, as well as get info on how to find and install them at [tinyurl.com/tla46-channels](https://tinyurl.com/tla46-channels). There is an extensive list of unofficial channels (which includes legitimate streaming services as well as those less so) at [tinyurl.com/tla46-plugin](https://tinyurl.com/tla46-plugin) and don't forget the Plex unofficial channels forum at [tinyurl.com/tla46-forum](https://tinyurl.com/tla46-forum).

PLEX'S CHERRY ON TOP OF THE ICING ON TOP OF THE CAKE IS ITS ABILITY TO STREAM TO MOBILE DEVICES.

One of the handiest 'grey' channels to install is G2G.fm, which gives you access to a tonne of new release movies and TV shows (visit the support forum at <https://forums.plex.tv/discussion/111730> for the download and help), ready to stream straight to Plex.

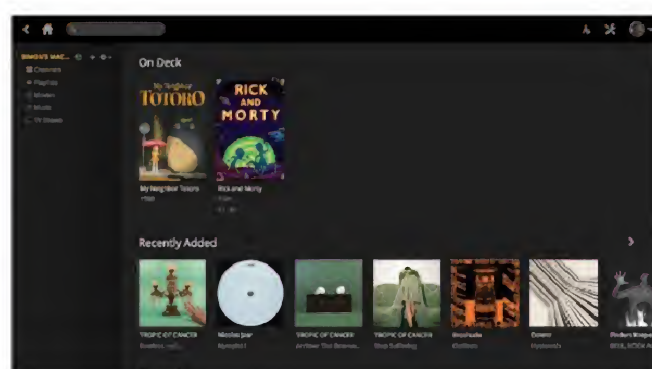
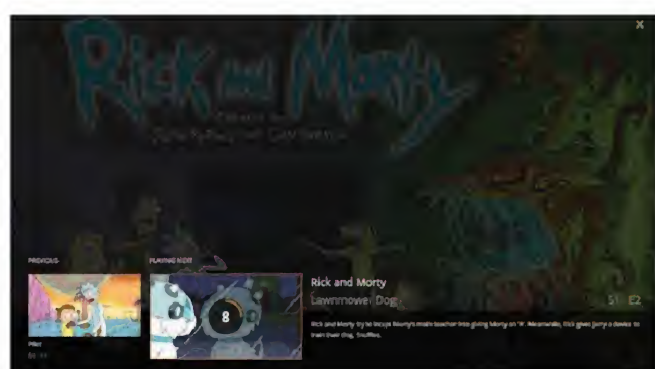
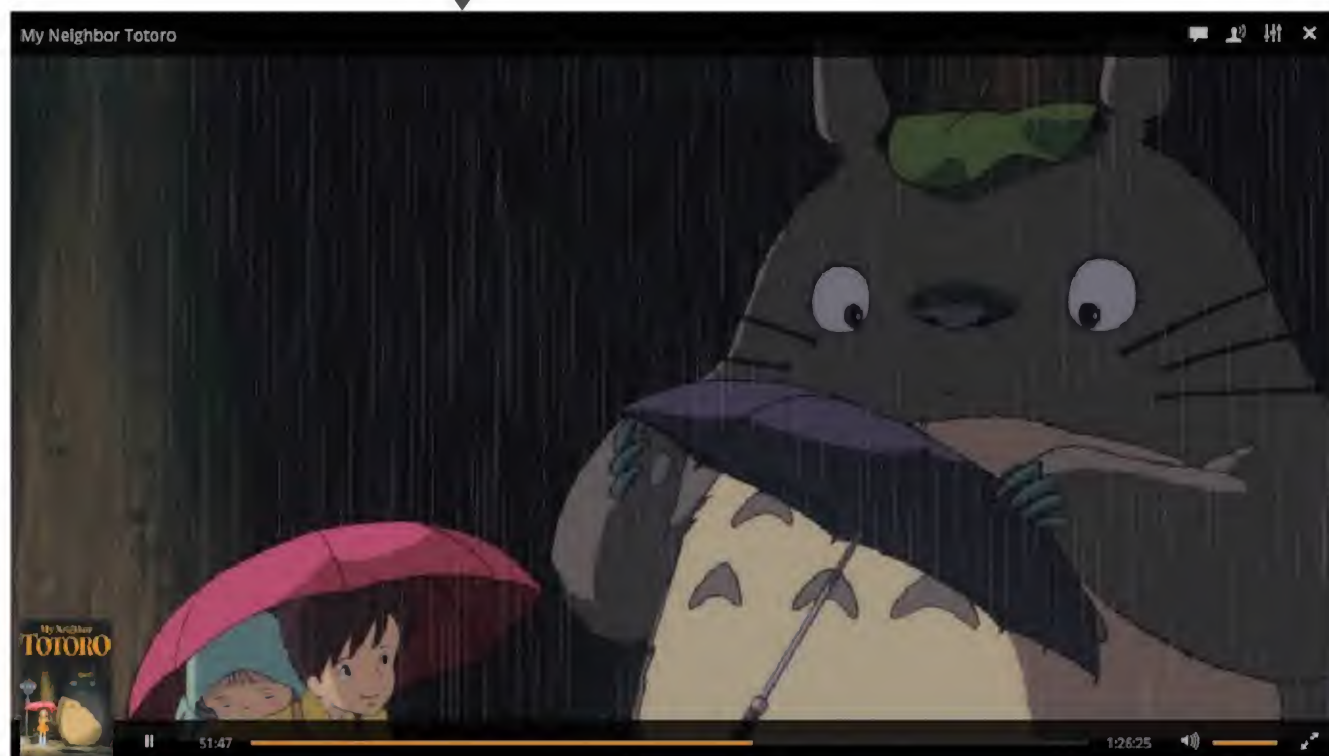
Another channel with a similar purpose is HDMoviesDownload.pro, available at <https://forums.plex.tv/discussion/161116>.

To install unofficial channels, follow the instructions at [tinyurl.com/tla46-unoff](https://tinyurl.com/tla46-unoff).

### STREAMING TO MOBILE

Plex's cherry on top of the icing on top of the cake is its ability to stream to mobile devices, and what makes it super special is that, for 99% of users, it requires no more setting up than a PC running Plex Media Server, a semi-decent home internet connection, and logging in to a mobile app.



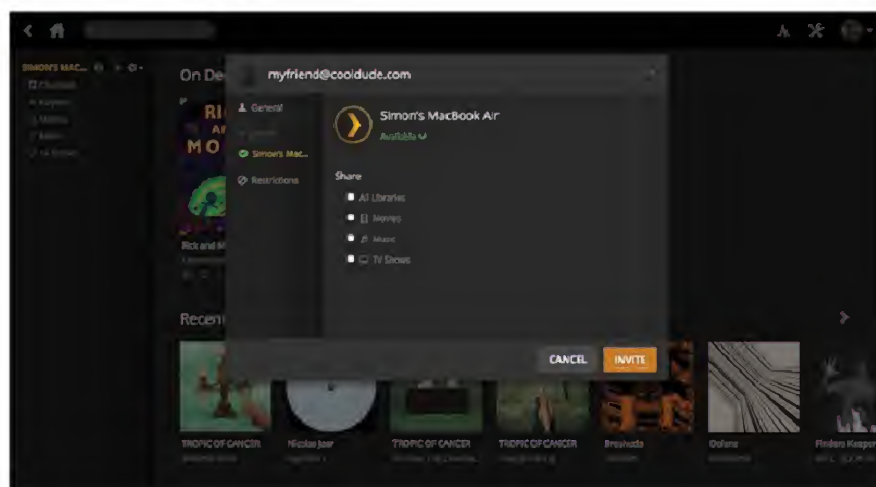


Plex Pass subscribers get free access to Plex's mobile apps (you need to log in to the app of choice), but if you don't want the subscription cost, you can also opt for a once-off in-app purchase, which will give you almost all of its features (notably missing is the ability to sync videos to your device for offline viewing).

Once you've logged in to a mobile app (as a Plex Pass subscriber), or logged in and unlocked an app (as a free user), you'll see the same library as you would from the Plex web browser interface — you'll have the same On Deck, Watch Later and content. Streaming is, therefore, as simple as selecting what you want to watch or listen to.

If you're having trouble connecting/getting your media to appear, open up the Plex web interface, click on the little cog icon next to your computer name in the left-hand navigation pane, then choose Settings. The second option in the list will be Remote Access and you should have a green tick next to it. No green tick? Visit [tinyurl.com/tla46-access](http://tinyurl.com/tla46-access) for help.

Notably, the mobile apps aren't just about streaming your media: they also give you an



interface to browse and send any Library content, or any media stored on your mobile device, to any other Plex device in your house, including Chromecasts or AirPlay-compatible devices, making them fully fledged remotes. No more fiddling with a keyboard and mouse while sitting on the couch! Touchscreen FTW!

I've covered the major features of Plex and, as such, you should now have a functioning

server, ready to stream to every device you own. However, there are still some lesser features buried within option menus that I wasn't able to cover here. I recommend you explore the options in both the web interface and mobile/other apps.

Plex is, in my opinion, the king of media streaming software, and I'm sure that, after using it for a while, you'll agree with me.



## HELP STATION

GET THE MOST FROM YOUR TECH

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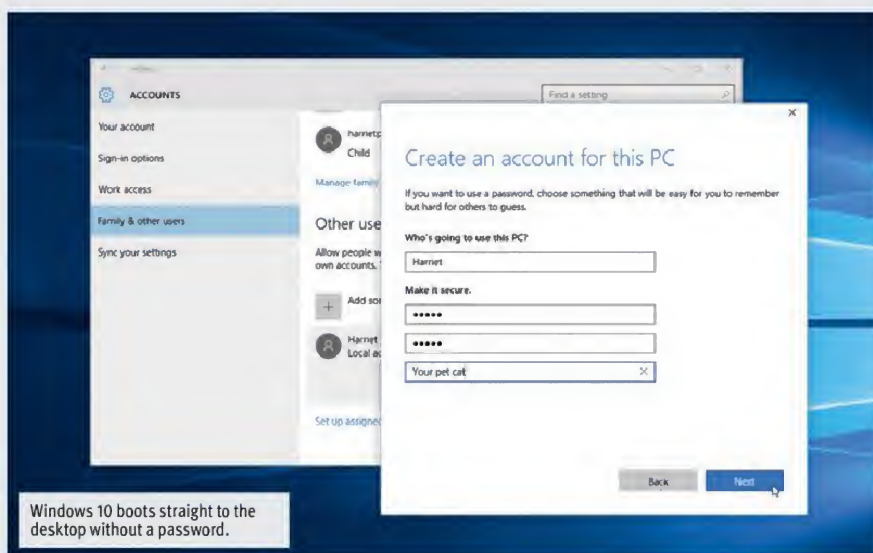
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## Smarthome

CONTROL YOUR SMART HOME  
WITH YOUR SMART WATCH

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## Tech frontiers

MAKE YOUR PHONE WIRELESS  
CHARGE FOR UNDER \$4Windows 10 boots straight to the  
desktop without a password.

## [ WINDOWS ]

Local user problem  
after Win10 upgrade

I updated my laptop from Windows 7 Home to Windows 10, opting to stick with my current local user account rather than use a Microsoft Account login. However, the laptop has two user accounts — my wife's and my own — and when starting, it boots directly to the user who was last logged in. We then log out to select the other user. Is there a way of interrupting this so we can choose who to log in as when booting?

[ MIKE PAINTER ]

*Graham Barlow replies:* First off, let me start by saying this definitely isn't normal behaviour. We instructed Mike to open the hidden User Accounts dialogue box (press Windows-R, type `netplwiz` and hit Enter to do so), which is where you normally configure Windows to automatically log on as a specified user. Mike discovered the "Users must enter a username and password to use this computer" wasn't ticked, so ticked and rebooted, but it had no effect — the computer still booted straight to his desktop. Mike subsequently revealed that neither his wife nor he had password-protected their accounts and that adding passwords to both via the Accounts section of Settings resulted in the problem being solved. Windows 10 now halts at the lock screen on startup, allowing Mike and his wife to select their account before completing the login process.



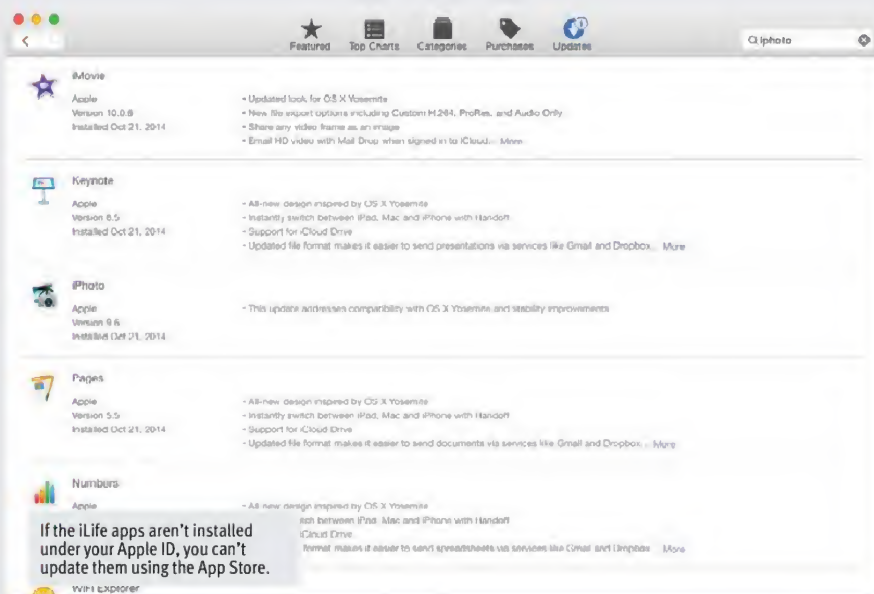
## [ MAC ]

Inheriting a  
MacBook

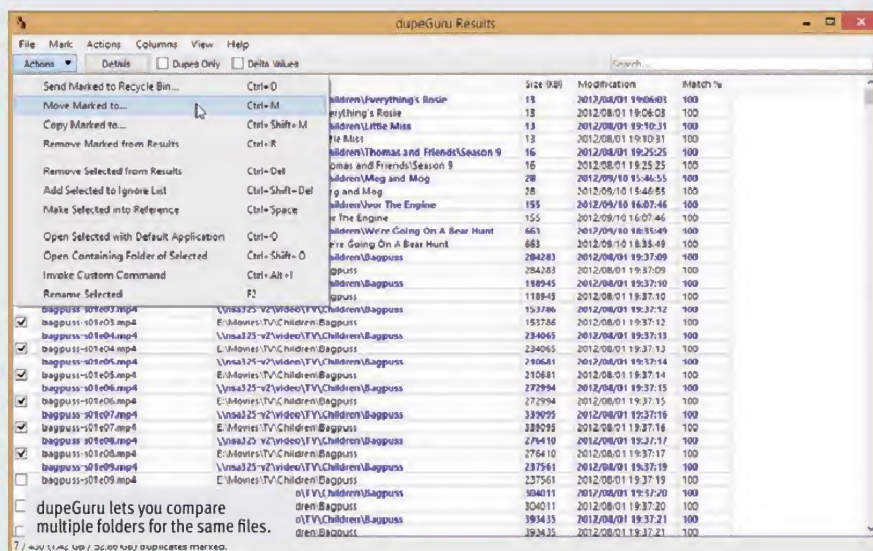
I have a MacBook, which I got when my daughter upgraded. Everything works fine and I'm the sole user. My only problem is with the App Store. When an update is selected, it asks for an Apple ID password, but with my daughter's ID, which is greyed out and can't be changed. Is there a way to change this to my own Apple ID, or do I have to reset the MacBook?

[ JOHN R. GORDON ]

*Luis Villazon replies:* The procedure for hand-me-down laptops is the same as for other







secondhand Macs: they need to be erased and reinstalled using Internet Recovery mode. This is because OS X is irrevocably tied to the Apple ID that was used to install it. You'll be able to install the operating system this way but any other apps from the App Store are tied to that Apple ID as well and you have no legal title to them. This doesn't just apply to third-party apps, it includes the iLife apps (iPhoto, iMovie and GarageBand). These are bundled for free with a new Mac, but they aren't actually part of OS X. Your daughter can give you the Mac hardware, but she can't transfer the apps tied to her Apple ID.

After you have reset the MacBook, you can sign in to the App Store and download these apps again. Or you could leave the MacBook tied to her Apple ID and just get her to type in her password whenever you need to update.

## [SECURITY] Mysteriously changed password

I recently had an email advising me that one of my online passwords had been changed, even though I hadn't changed it myself! When I tried to log in, it no longer accepted my password and I had to spend a long time exchanging phone calls and emails with customer services to get my account reset. The website in question was unable to tell me how this happened, and seemed to think it was someone in my family, which it wasn't. Do you have any ideas about how hackers could have done this? How can I protect myself?

[ANDERS BLUMGARDENER]

**Luis Villazon replies:** They probably just guessed the answer to your secret question. The other easy way to hack someone is to trick them into installing a keylogger on their PC. A keylogger is a little program that invisibly records every keystroke you make on your keyboard and then sends it to a hacker, who looks through this file for a likely looking password, typed just after you entered "www.

amazon.com", for example. But if you'd been hacked with a keylogger, you'd probably have seen a lot more than just one lone website hacked. And installing a keylogger requires physical access to your PC, or tricking you into downloading and executing a trojan.

Guessing most people's secret question on the other hand is usually very easy. Your mother's maiden name is a matter of public record and things like your pet's name or your favourite movie can often be guessed by snooping through your Facebook page. Hackers can easily look at public profiles, which often shows the school people went to, and create a fake profile posing as someone from that school. Then they make a friend request from that profile, which many people will accept out of curiosity. If you insist on creating your own passwords (rather than using a dedicated password manager like LastPass), the solution is to treat the 'answer' to your secret question as just another password. What is your mother's maiden name? Why, it's octagon294 br@vura of course. Secret questions aren't used much anymore, precisely because they aren't very secure. Most sites will only send password reset links to email addresses that have previously been associated with your account.

## [MEDIA] How to clean up a media library

I'm trying to consolidate my library of old radio shows that are scattered across several hard drives. My main problem is I have many duplicates with similar (but not always identical) names. What tools can you recommend for bringing them all together and then batch renaming them all?

[RICHARD JONES]

**Jeremy Laird replies:** There are a number of approaches you can take, but I'd recommend handling the consolidation and rename processes separately. When it comes to weeding out duplicates, take a look at dupeGuru ([www.hardcoded.net/dupeguru](http://www.hardcoded.net/dupeguru)).

Select your 'master' folder first, then choose folders where you think duplicates may occur. The scan takes some time to complete, but once it's done, your duplicates are clearly marked, allowing you to delete them if you wish. Once your files are consolidated, the quickest way to rename them is through the use of a tool such as Bulk Rename Utility, which offers a host of different ways to rename files using patterns you define.

## [NETWORKING] IP conflict conundrum

My wife's laptop will happily use our wireless connection right up until the point when I connect up to it. However, at this point, her laptop loses the connection a few minutes after mine is switched on. She receives an onscreen error about IP address conflicts every few minutes, and whatever I do, it cannot be resolved until my own laptop shuts down. I would appreciate your help!

[JOHN WALLIS]

**Zak Storey replies:** The usual suspect — that both laptops had been assigned the same IP address — didn't apply in this case, as the problem only occurred when John's laptop was on. John revealed he had HomeNet Manager installed for security purposes. After uninstalling this, he discovered that his wife's laptop could now happily coexist with his. HomeNet Manager is no longer developed or supported — John was using it to add another layer of protection to his network. He'd already protected his wireless connection through password-protected encryption, disabling its SSID and filtering MAC addresses, which should provide more than adequate protection. If he wants to scan his network for possible intruders, a tool such as Advanced IP Scanner ([www.advanced-ip-scanner.com](http://www.advanced-ip-scanner.com)) should suffice.

## [WINDOWS] What's happened to my sound?

My granddaughter was playing around on my Windows 7 PC, and temporarily muted the sound. The problem is, I can't get it back. Can you help me find out what's gone wrong?

[JOY SMITH]

**Graham Barlow replies:** This often happens because the default playback device has somehow been changed. Play some music on your PC, then right-click the white speaker icon in the Taskbar's notification area (if it's not present, click the ^ button in the bar to reveal it), then choose 'Playback devices'. Look to see which device is currently set as the default (the level meter should be rising up and down next to it), then select your speakers or other chosen device and click 'Set Default' to bring the sound back. ■



[ WINDOWS ]

# Wrest back control from Windows Update

DISCOVER HOW TO TAME THE WORST EXCESSES OF WINDOWS UPDATE AND REGAIN CONTROL OF YOUR PC.

[ NICK PEERS ]

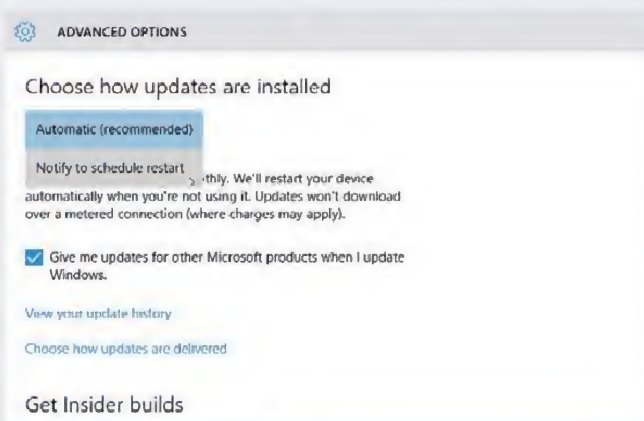
THE NEW WINDOWS Update mechanism in Windows 10 has been rigidly designed. While there's good reason to ensure critical security patches and fixes are installed automatically, some Windows 10 users have already suffered from Microsoft's over-zealous policy of forcing updates before those updates have been properly tested.

Thankfully, there are some ways in which you can regain control of how Windows Update operates — particularly if you're a Windows 10 Pro user. But even if you're stuck with Windows 10 Home, where it's impossible to change the automatic setting, there are still tips, tricks and tools you can use to regain some control and make more from Windows Update.

In this tutorial, we'll reveal everything you need to put Windows Update back in its place.

## STEP BY STEP

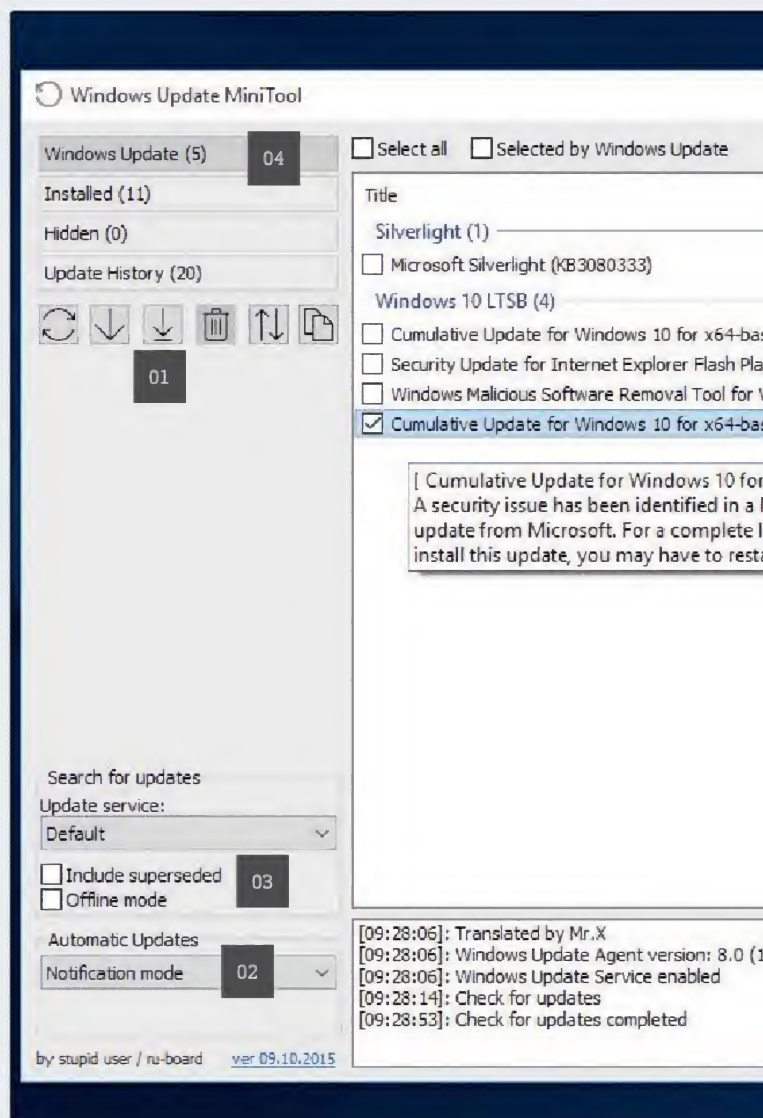
### CONFIGURE WINDOWS UPDATE



01

#### BASIC SETTINGS

Click Start > Settings > Update & Security > Windows Update to check for updates. Click "Advanced options" to change how updates are installed — if you select "Notify to schedule restart", you'll be prompted whenever updates have been downloaded and installed. You can also opt to receive updates for other Microsoft products like Office here — just tick the box.



#### ADVANCED OPTIONS

#### Choose how updates are installed

Automatic (recommended)

Keep everything running smoothly. We'll restart your device automatically when you're not using it. Updates won't download over a metered connection (where charges may apply).

☒ Give me updates for other Microsoft products when I update Windows.

☒ **Defer upgrades**  
Learn more

[View your update history](#)

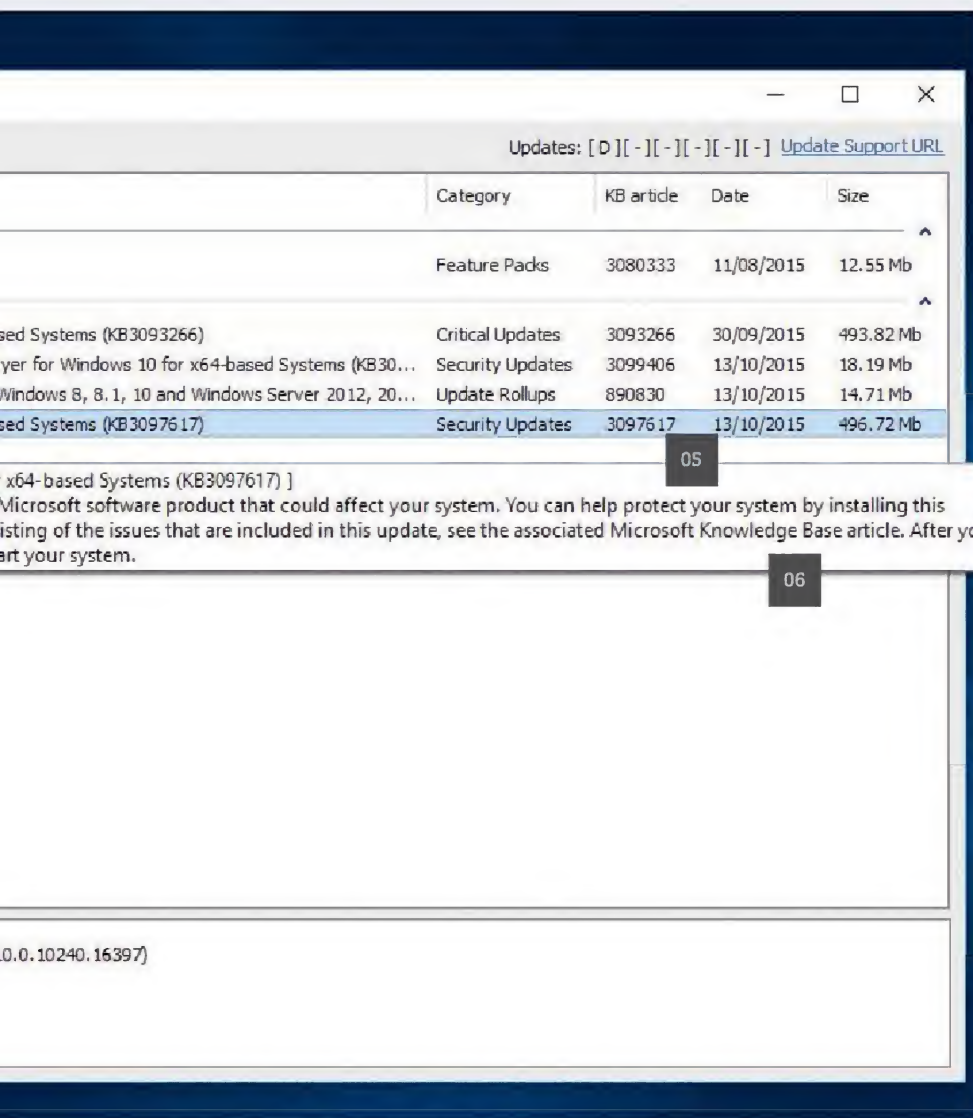
[Choose how updates are delivered](#)

02

#### DEFER UPDATES

Windows 10 Pro users can postpone non-essential updates, giving time for any bugs to be discovered and ironed out. Tick the "Defer upgrades" box to enable this — you'll effectively be switched to the "Current branch for Business", which means only essential security updates are installed immediately; others will be deferred until they've been more thoroughly tested (by Home users).





## 01 CONTROLS

These perform the following actions: check for updates, download only, install, remove, hide/unhide and copy to clipboard.

## 02 CONFIGURE UPDATES

Click here to tweak automatic updates in Windows 10 Pro after you've followed step six of the guide.

## 03 UPDATE REPOSITORY

Choose which update repository to search — in most cases the Default choice is best.

## 04 SWITCH VIEW

Click these buttons to move between viewing the available, installed and hidden updates, plus review your update history.

## 06 VIEW UPDATES

All applicable updates based on your viewing choice are displayed here. Tick the box next to each to select them.

## 06 MORE INFO

Roll the cursor over an update to reveal this popup providing a detailed description.

## Updates from more than one place

Download Windows updates and apps from other PCs in addition to Microsoft. This can help speed up app and update downloads. [Learn more](#)

When this is turned on, your PC may also send parts of previously downloaded Windows updates and apps to PCs on your local network or PCs on the Internet, depending on what's selected below.

☒ On

Get updates from Microsoft, and get updates from and send updates to

☒ PCs on my local network

☐ PCs on my local network, and PCs on the Internet

01

## CONTROL HOW UPDATES ARE DELIVERED

By default, Microsoft will use your PC to share updates with other computers, which will sap internet speed and use up any monthly allowance you may have. Click "Choose how updates are delivered" to change this — flick the main switch to Off if you only have one Windows 10 PC on your network, or choose "PCs on my local network" to reduce internet usage in a multi-PC household.

Allow your PC to be discoverable by other PCs and devices on this network. We recommend turning this on for private networks at home or work, but turning it off for public networks to help keep your stuff safe.

☒ On

## Metered connection

If you have a limited data plan and want more control over data usage, make this connection a metered network. Some apps might work differently to reduce data usage when you're connected to this network.

Set as metered connection

☒ On

## Properties

SSID:

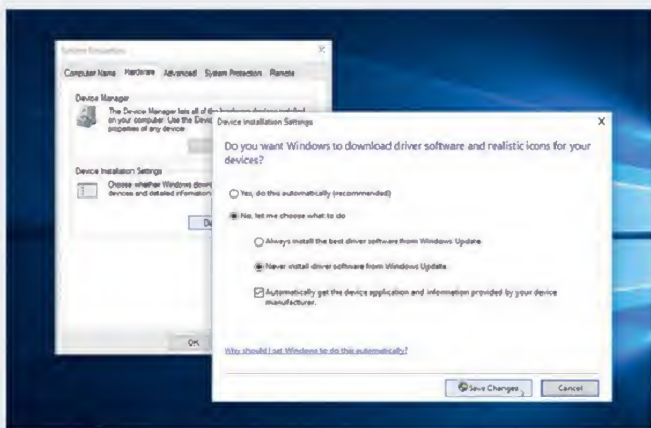
TP-LINK 2.4GHz 96D886

02

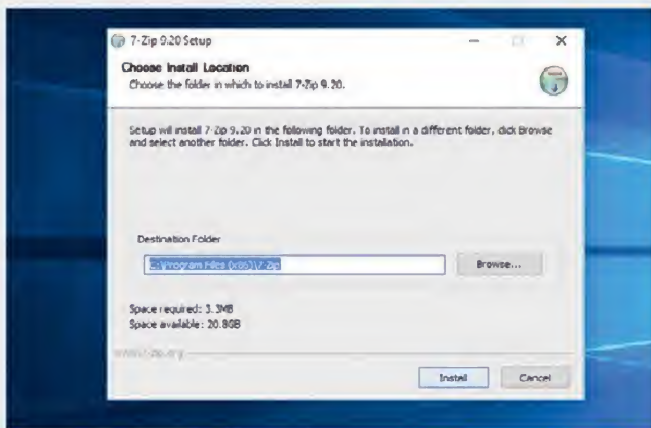
## TRICK WINDOWS UPDATE

If you connect through a wireless connection, you can delay updates by claiming you're on a metered connection — click Start > Settings > Network & Internet > WiFi and click "Manage WiFi settings". Flick the Metered Connection switch to On and updates won't be delivered until you switch it off. Set an alarm to remind yourself to flick it off periodically to check for updates manually.

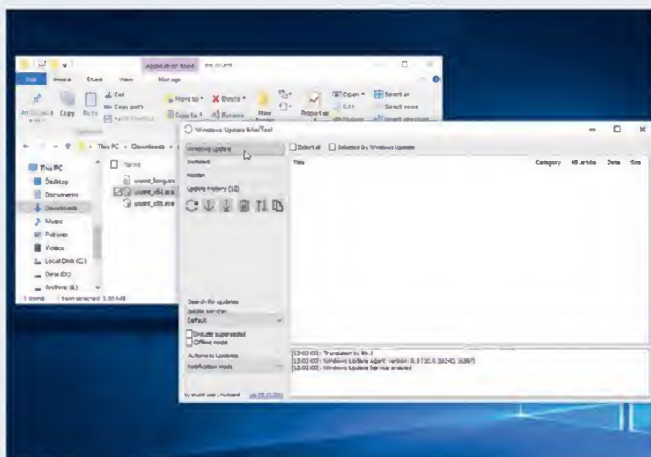




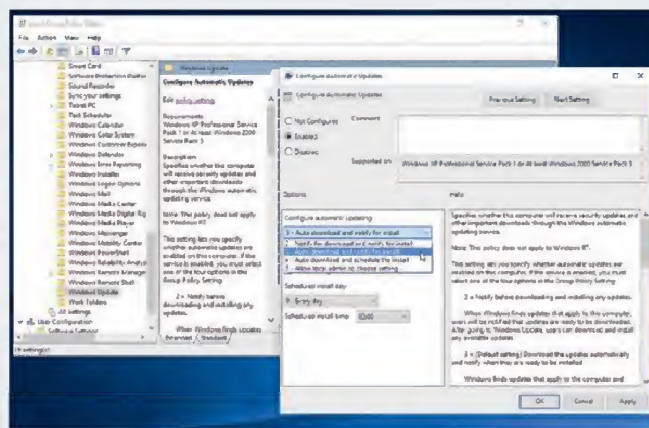
- 05** **DISABLE AUTOMATIC DRIVER UPDATES**  
By default, Windows Update updates supported hardware devices too — if you'd prefer to manage this yourself, right-click the Start button and choose System. Click Advanced System Settings, switch to the Hardware tab and click Device Installation Settings. Select “No, let me choose what to do” followed by “Never install driver software” and click Save Changes.



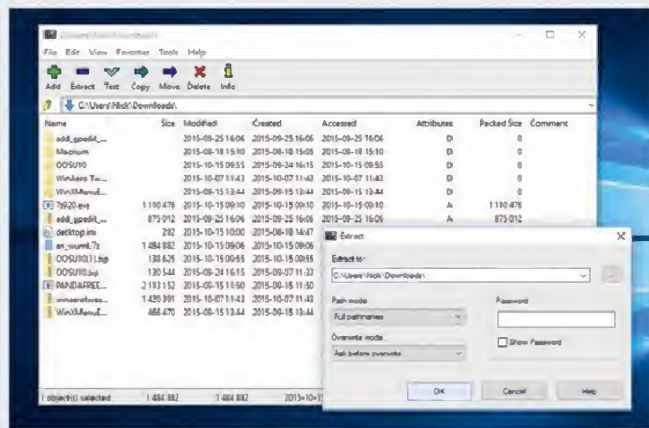
- 07** **MANAGE UPDATES WITH MINITOOL**  
Windows Update MiniTool is a portable app that gives you more control over viewing, managing and hiding updates. It's delivered in a .7z file, which can be extracted using a free program called 7-Zip. Download and install it from [www.7-zip.org](http://www.7-zip.org). Once done, browse to <http://bit.ly/winupdmini> and click the en\_wumt.7z icon to save it to your Downloads folder.



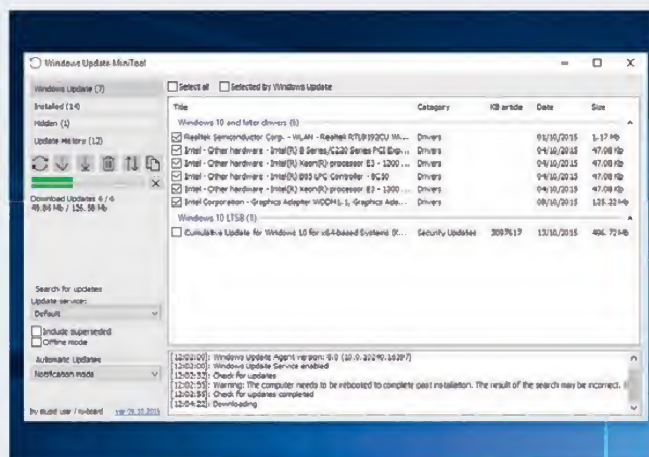
- 09** **LAUNCH APP**  
Open the en\_wumt folder and double-click wumt\_x64.exe if you're running the 64-bit version of Windows, or wumt\_x86.exe for the 32-bit version to launch the app. You'll see a two-paneled window appear with options on the left. Use the annotation on the previous page to help identify key parts of the program, then click the “Check for updates” button to review available updates.



- 06** **DISABLE AUTOMATIC UPDATES**  
Pro edition users should type “gpedit” into the Search box and click “Edit group policy”. Expand Administrative Templates > Windows Components under Computer Configuration and select Windows Update. Click Configure Automatic Updates in the right-hand pane, select Enabled and then pick option 2 or 3 to force Windows to wait for your say so before installing updates.



- 06** **EXTRACT AND RUN**  
Open Z-Zip File Manager from Start > All Apps > 7-Zip menu. Click Computer, then browse to your Downloads folder (typically C:\Users\username\Downloads), select en\_wumt.7z and click Extract. Remove the trailing \en\_wumt from the “Extract to:” box and click OK. Once the files have been extracted, close 7-Zip and navigate to your Downloads folder in File Explorer.



- 10** **MANAGE AND TWEAK**  
Roll your mouse over an update for a more detailed description, or select it and click Update Support URL to see if a Knowledgebase article can provide more information. You can hide any unwanted non-critical updates from view. Download and install individual updates from here, plus review installed and hidden updates, plus your update history using the controls.





[MAC]

# Using OS X's new split view

DISCOVER EL CAPITAN'S WAY TO BOOST PRODUCTIVITY WHEN USING TWO APPS.

[GRAHAM BARLOW]

WINDOW MANAGEMENT IN OS X has improved over the years, but you still had to spend an inordinate amount of time resizing and repositioning windows to set up your working environment.

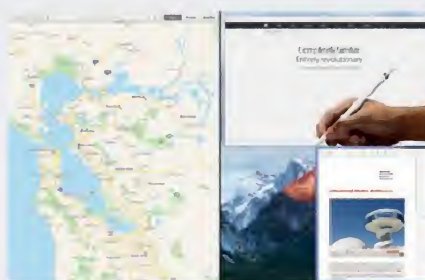
That's why Apple has come up with Split View in El Capitan. It's ideal when you need to focus on two apps at once. In fact, it's so good that it could revolutionise how you use apps, especially on small screens. Similar to fullscreen mode, Split View puts two apps side-by-side and fills the entire screen as

though they're both running fullscreen (apps you want to use in Split View need to support fullscreen mode). This provides more space for whatever you're doing.

You aren't stuck with the split that OS X determines. Between the two apps is a bar that you can drag left or right to change the amount of space allocated to each one. Mastering Split View is all about knowing where and what to click, so, here, we reveal its secrets. Get ready to change the way you use your Mac...

[STEP BY STEP]

USE SPLIT VIEW THE QUICK WAY



## 01 LOCATE YOUR FIRST APP

Make sure both apps are open. Locate the first app, and click and hold the green button in the top left corner of its window. Now drag the window to the left or right of the screen, which will be highlighted with a blue overlay. Release the mouse or trackpad to fill that area with the app.

## 02 FIND A SECOND APP

With one app taking up half the screen, the other windows that are open become thumbnails in the other half. Select the app (or specific window) you want to see on that side of the screen by clicking its thumbnail. The app will zoom to fill that area. You're now in Split View mode.

## A MOVE BETWEEN APPS

Here, we've got Maps open in the window on the left, and Photos on the right. Both apps function normally, and you can move the pointer from one to the other. Only the app that has the focus will respond to keyboard commands, though. You can quickly press Command-Tab to switch between the apps — if it isn't clear which has it, note the colours of their toolbars.

## B ALLOCATED SPACE

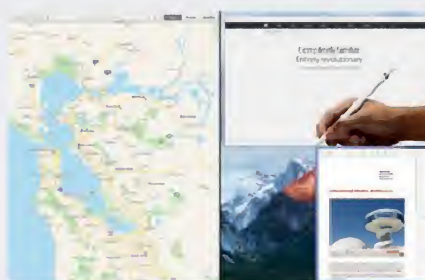
OS X works out the best amount of space for each app. When you combine Mail and Reminders, only a narrow strip is allocated to the latter. OS X also works out the minimum required width of each app. So iBooks and Pages can't be put side-by-side on a 15-inch MacBook Pro, yet they can be combined on an external, higher resolution display. On a MacBook with a Retina display, you can sometimes overcome this. In System Preferences > Displays > Display, click Scaled and choose an option further towards the More Space end of the range — this causes everything to be rendered smaller on the screen, yet some apps provide a zoom control, so you can keep what you're working on comfortably large. If you use this technique often, consider buying EasyRes (\$7.99, Mac App Store), which enables you to quickly switch resolutions from the menu bar.

## C SEPARATOR LINE

The black line can be dragged left or right to change the amount of space allocated to each app. The apps will redraw their contents to make the best use of the available space. Double-click the line to split the screen evenly.

## D EXIT SPLIT VIEW

Move the pointer to the top of the screen and the menu bar and the apps' title bars will appear. To take either app out of Split View, click its green button.



## 01 LOCATE YOUR FIRST APP

Make sure both apps are open. Locate the first app, and click and hold the green button in the top left corner of its window. Now drag the window to the left or right of the screen, which will be highlighted with a blue overlay. Release the mouse or trackpad to fill that area with the app.

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## 03 ALLOCATE SPACE

Between the two apps is a black line. Put the pointer over the line and click and drag to allocate space. To exit Split View, move the pointer to the top of the screen to reveal the menu bar and each app's title bar. Click either app's green button to remove it; the other remains in fullscreen mode.



[ ANDROID ]

# Use Marshmallow's System UI Tuner to tweak your Android

MARSHMALLOW'S HIDDEN SYSTEM UI TUNER ALLOWS CUSTOMISATION OF YOUR ANDROID DEVICE'S STATUS BAR AND QUICK SETTINGS.

[ SIMON CHESTER ]

WHAT WITH MORE and more handsets running Android's latest and greatest version, Marshmallow, it's worth pointing out some of its best new features. Last month, I taught you how to better manage your privacy with its fine-grained app permissions. This month, I'll show you how to remove, add or rearrange your Quick Settings tiles (those that appear on the second pull-down of the notification panel), as well as tweak the icons in your Status Bar (right at the top of your screen).

These may not seem like revolutionary ideas, but — and you may think me a little peculiar for this — it's the inclusion of these features that have, for the first time, stopped me from installing a custom rom (CyanogenMod), and instead sticking with stock Android. In my opinion, this is a landmark moment, and I look forward to these options maturing in the coming releases.

Both of these options are available from a hidden menu in Android (showing that they aren't quite yet 'prime time' features, and subsequently sparking my comment on their maturity). I haven't found any bugs or anything, so let's go ahead and activate said menu — simply pull down the notification drawer twice to expose the Quick Settings panel, then press and hold the little cog icon that usually takes you to Android Settings. It'll soon start spinning (you may not be able to see it happening underneath your fingertip, however — just hold it for about five seconds to be sure), and once you release it, you'll see a toast notification telling you that you've activated it.

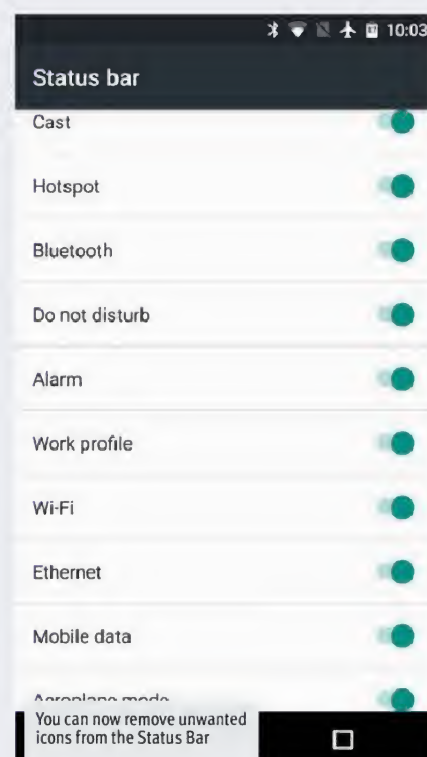
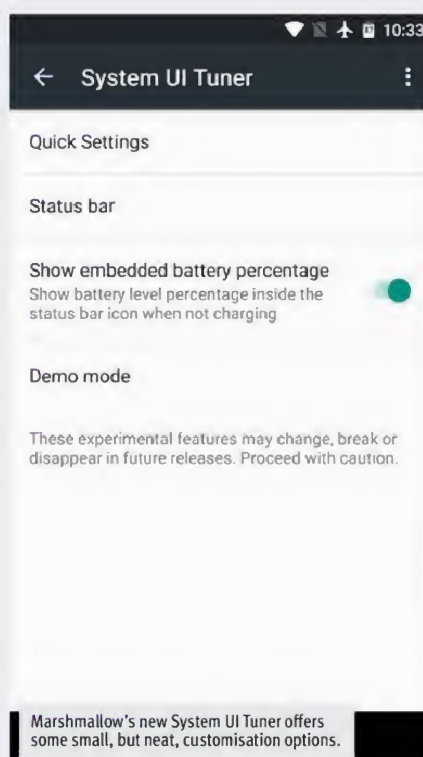
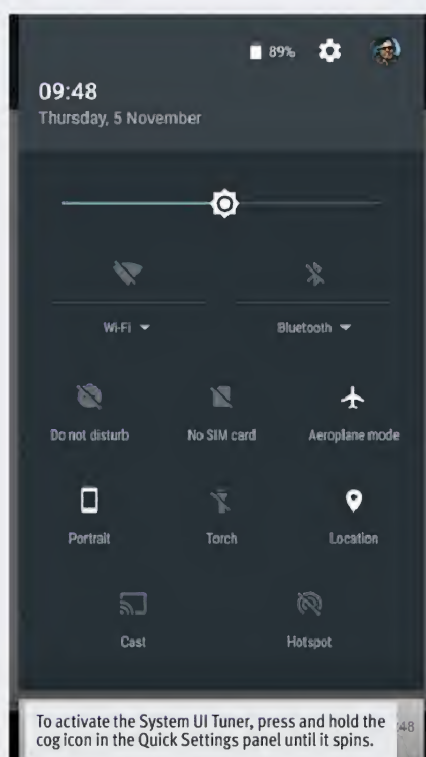
Now press the cog icon again to open up Android Settings, and right down the bottom, you'll see the new System UI Tuner menu. Open it now and acknowledge the caveat.

You're then faced with four new options: Quick Settings, Status Bar, Show embedded battery percentage, and Demo mode.

Demo mode is just a way to have all your Status Bar icons show as full (handy for screenshots, but for little else). Show battery percentage overlays the battery remaining icon with a percentage value of remaining charge, which is actually my preference.

The Status Bar menu allows you to choose which icons appear in your Status Bar. If you're a smartwatch or BT hands-free user, and it annoys you to have a permanent Bluetooth icon showing, this is how you can remove it from the status bar. Similarly, you can remove any of the items normally seen there, from the network signal to the clock and others.

The Quick Settings menu is where you can remove or rearrange the settings tiles. To change their order, just drag any icon to a





## THE BROADCAST TILE

If you pressed the 'Add Tile' button from within the Quick Settings menu in the System UI Tuner, you would have noticed a mysterious Broadcast Tile that, when added, seemed to do nothing at all.

Well, it's actually an option for developers — if you have an app with an intent (basically an action an app can perform when called to), you can create a link to that intent in the form of a Quick Settings tile, which would allow any user to trigger any function of your app.

If you understand what it means to broadcast an intent in Android, and aren't shy of the Android SDK, you can learn a bit more about the tiles, including how to code your own custom ones, at <http://tinyurl.com/tla46-tiles>.

But what does this mean for us laypeople? Well, not a great deal. I did find one app on the Play Store that allows you to create a custom tile — Custom Quick Settings by Mighty Quinn Apps — but it doesn't seem to allow you to tie it into other app's intents (which would make it really handy for Android power users like myself).

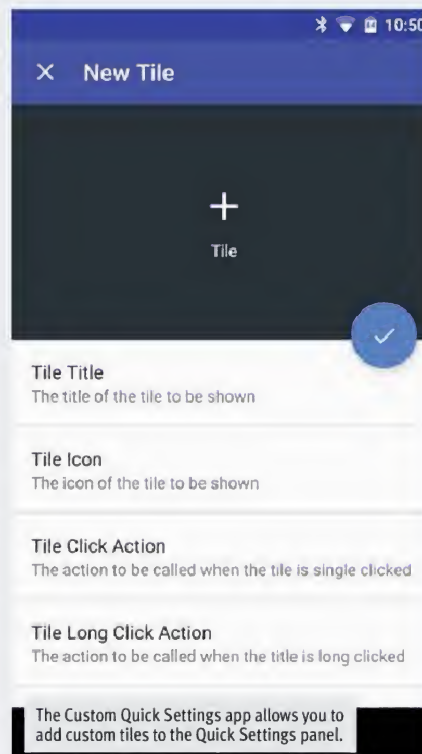
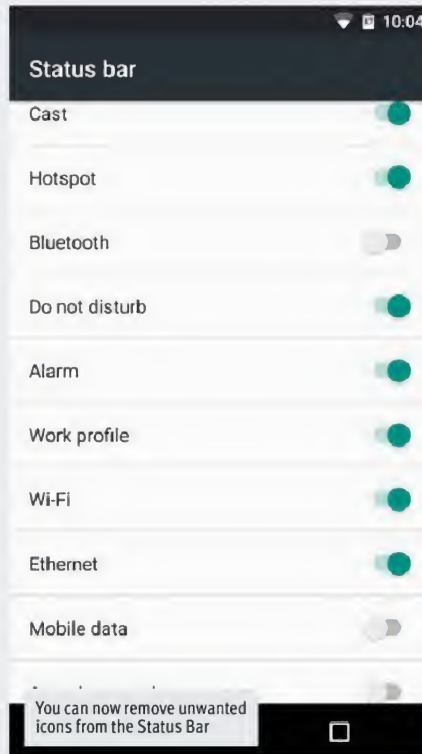
One thing it can do, however, is have it open a specific app or URL on a tap (plus a different one on a long-press) and, perhaps redundantly, allow you to create a tile that toggles the very same settings that the standard tiles do (albeit with a different icon, if you wish).

The app is ad-supported, but you can pay around \$2 to remove them. If the app allowed you to tie into existing apps intents, or to choose icons beyond those included with the app, then I'd perhaps see worth in paying that \$2. As it stands, however, it's not quite useful enough for me to justify.

If you're interested in adding an app or URL shortcut to your Quick Settings, then download Custom Quick Settings and open it. Press the plus button and you'll be given some instructions.

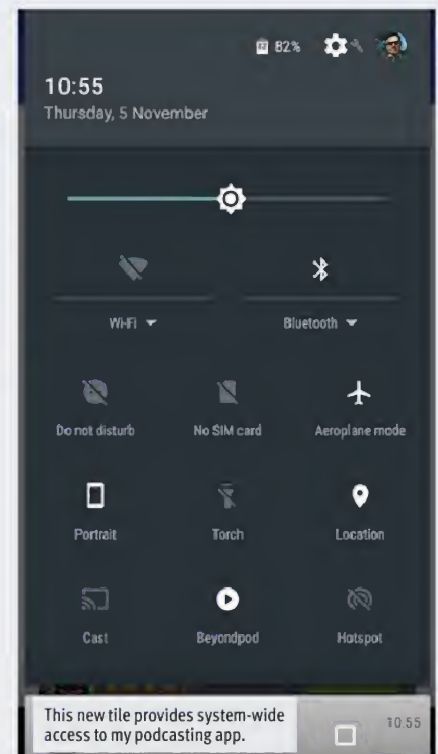
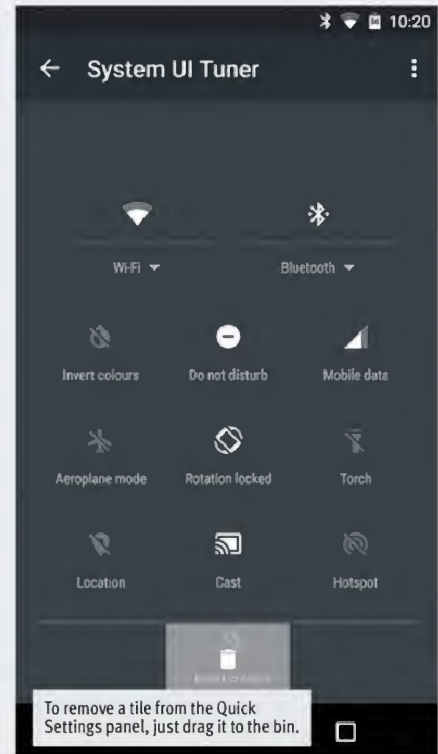
Pro tip: pressing the System UI Tuner button in the app will not only take you to it, but will also copy the new Broadcast Tile name to your clipboard. So do what it says and add a new Broadcast Tile, pasting the name or manually typing 'CUSTOMTILE0' (or 'CUSTOMTILE1', 'CUSTOMTILE2' etc. for each subsequent tile). Feel free to position it where you please. Next, flick back to the Custom Quick Settings app, check the box and continue.

This is where you get to choose a name and icon for the tile, as well as an action. From here, it's all pretty self-explanatory: just make your way down the list, and your new tile will be created in a few short minutes.



new position. To remove one, simply press and hold, then drag it to the bin icon that appears down the bottom. To add a new one, press the Add Tile icon down the bottom.

When adding a new tile, you'll probably noticed that they've actually all already been added (with the exception of the Broadcast Tile, which I'll explain in the side bar), which is a bit of a disappointment for those that have



previously run custom roms and have been given myriad options for the Quick Settings panel. While you may not be able to expand the Quick Settings' functionality beyond the Marshmallow default, it's still a boon to minimalists to be able to prevent those seldom or unused settings from cluttering up their Quick Panel. ■



[ iOS ]

# Email attachments in iOS 9

ADDING ATTACHMENTS TO EMAIL MESSAGES JUST GOT WHOLE LOT EASIER IN iOS 9.

[ KENNY HEMPHIL ]

FOR MANY OF us, our iPhone or iPad has become just as much an essential tool for work as a Mac. We use it to make phone calls, send messages, record appointments, research things and, of course, send email.

The last of those tasks, however, has been hamstrung by a glaring omission — the inability to add attachments. Sure, you could send a file as an attachment from within the app where it's viewed or created, using share sheets, but you couldn't add an attachment to an email in the same way you could on a Mac — while composing your message. Until now. Of all the new features in iOS 9,

this — for heavy email users, at least — could be the killer new feature. If you haven't already upgraded, this alone might convince you to do so.

Adding attachments in Mail on both the iPhone and iPad is done just as easily as creating, typing and sending the message itself. However, the way in which you add attachments differs depending on whether you're using an iPhone or an iPad, though the outcome is the same. Also, depending on the type of file, your attachment may even be displayed inline in the body of the email when you send it.

OF ALL iOS 9'S NEW FEATURES, THIS — FOR HEAVY EMAIL USERS, AT LEAST — COULD BE THE KILLER NEW FEATURE.

## 01 OPTIONS BAR

When writing an email, tap and briefly hold on its body display extra options. On an iPhone, tap the arrow at the bar's right side to find the Add Attachment option.

## 02 iCloud Drive

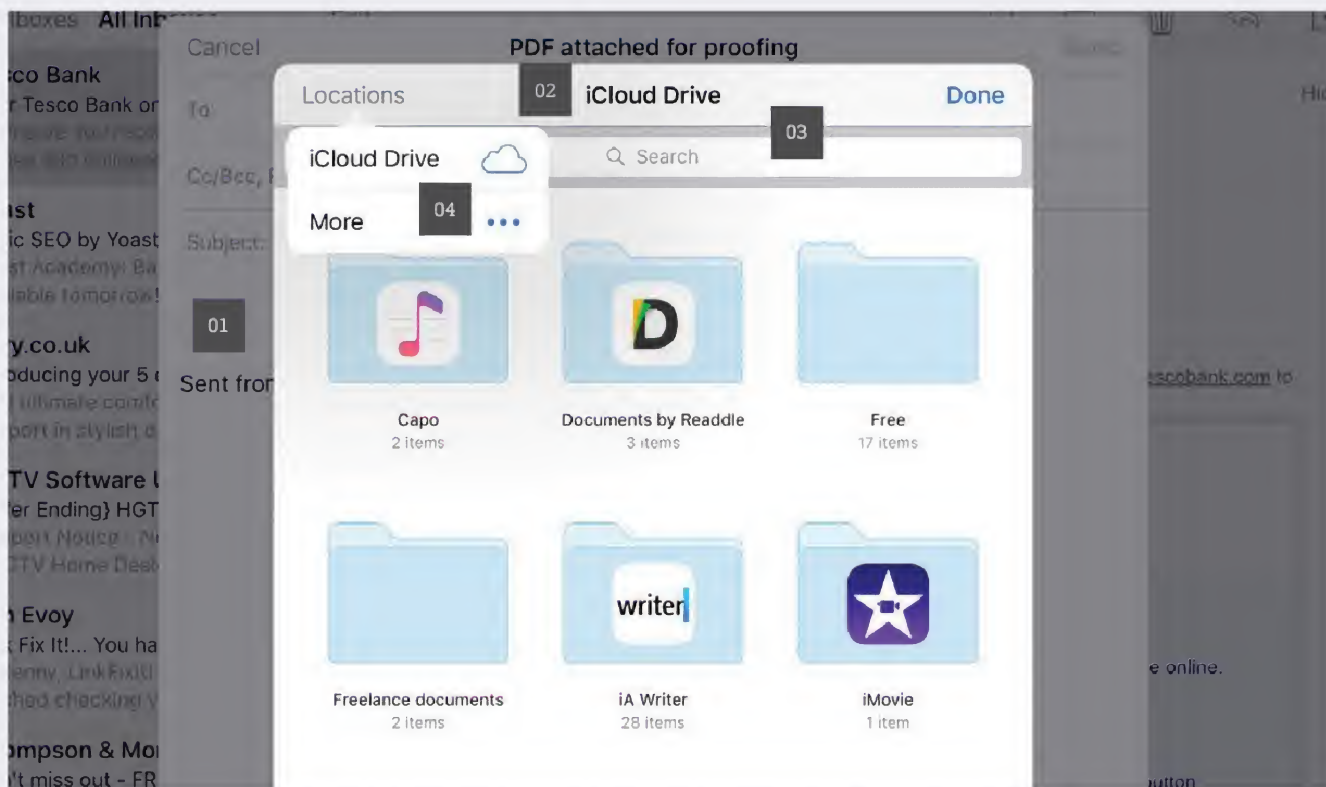
The default source for attachments is iCloud Drive, where you can access files created in Apple's iWork and iLife apps and third-party apps that save there.

## 03 SEARCH

If you don't recall where on iCloud Drive you stored a file, use the search bar to find it. Type a filename, or part of one. This filters files stored on Drive as soon as you start typing.

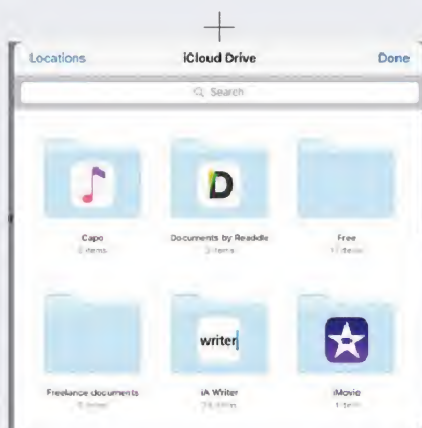
## 04 LOCATIONS

Attach items from elsewhere, say in Dropbox or OneDrive, by tapping Locations, then More. Use the panel to choose another source for attachments.





## ADD ATTACHMENTS TO MAIL MESSAGES



## 01 ADD AN ATTACHMENT

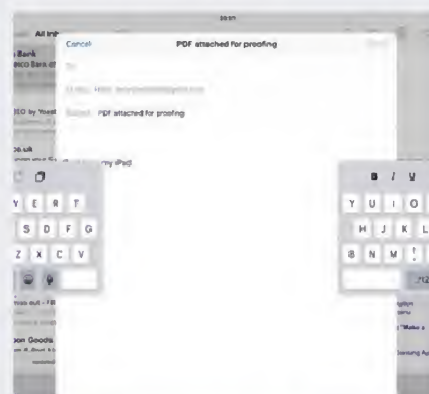
In Mail, create a new message or reply to one you've received. Add recipients and type the body of the email. When you're ready to add an attachment, tap and briefly hold in the body of the email, then let go. In the menu, find Add Attachment and tap it.

## 02 ADD FROM iCloud DRIVE

By default, you're shown the contents of the top level of your iCloud Drive (if it's enabled in Settings > iCloud). If the item you want to send is in Drive, tap the relevant folder to open it, then tap the file. It will be attached to your message, just as it would be on your Mac.

## 03 ADD DIFFERENT SOURCES

If the file you want isn't on iCloud Drive, tap Locations at the top-left of the panel that opens after you tap Add Attachment. Tap More for a list of apps installed on your device that can be used to source an attachment, and turn on the switch next to any you want to use.



## 04 CHOOSE A SOURCE

You can reorder the apps in the list by tapping More, then dragging up or down from the three lines to the right of one's name. When you're finished, tap Done. You'll need to tap Locations again to go back to the list and choose a source for the attachment.

## 05 CHOOSE THE ATTACHMENT

Tap the source you want (and sign in, if required for a particular service). You'll be taken to the app; find the file you want and then tap it to attach it. Certain file formats, such as JPEG and PNG images, are displayed inline in emails, but many others are simply shown as an icon.

## 06 AN iPad SHORTCUT

If you're using an iPad, just above the top row in its on-screen keyboard are shortcuts that save you having to call up the options bar. They appear after you tap in the message's body. Among them is a paper clip icon, which enables you to browse for an attachment in just one tap.



## 07 MULTIPLE ATTACHMENTS

To add more than one attachment, just repeat steps 1–5 for each. Sadly, there's no way to choose multiple files at once. Each file will be added to your email and its icon, or a preview if it's a supported file type, will be displayed wherever the insertion point is positioned.

## 08 DELETE ATTACHMENTS

If you change your mind after adding an attachment, you can remove it by tapping on the body of the email, just to the right of the attachment. You should see the insertion point flashing to the right of it. Next, tap the Delete key on the keyboard to remove the attachment.

## DOCUMENTS

Readdle's Documents 5 (free, [readdle.com/documents](http://readdle.com/documents)) enables access to files in other apps, or stored on FTP or WebDAV servers. By selecting it as a source in Mail, you can add those files as attachments. If your NAS drive has an iOS app, you can add attachments from there too. ■



[ PRIVACY AND SECURITY ]

# Keeping your communications truly secure

MAINTAINING END-TO-END COMMUNICATIONS SECURITY ISN'T JUST FOR SPIES.

[NATHAN TAYLOR]

IF YOU'D LIKE to be certain that nobody is listening in on your communications, you'll need a good encryption tool. This month, we're going to take a look at a few tools we highly recommend.

## JITSI

Jitsi ([jitsi.org](http://jitsi.org)) is one of our favourite messaging tools for Windows, not least because it's open source and its security is so comprehensive. It supports text, voice and video chat, as well as conference calls and presence (that is, knowing whether other people are online). It can use your Google, Facebook or other XMPP-based messaging services, but adds a layer of security on top of text, voice and video chat. That layer of security means that only you and the recipient can see the contents of the message — not even Google or Facebook can monitor what you're saying or typing.

For text chat, it uses what's called Off-the-Record (OTR) messaging, a standard protocol for encrypting text messages and authenticating the person at the other end. For voice and video, it uses ZRTP, another standards-based security protocol for encrypting multimedia messages between two parties.

ZRTP is enabled by default, and Jitsi will automatically use it if the person at the other end is also using a communications client that supports ZRTP. If they don't have it, a regular (non-encrypted) connection will be established; if they do, a ZRTP link will be created, which you'll be able to see via a small icon next to the Connected notification.

The first time you make a call, it may take a few seconds for the security to kick in (you can actually start talking before it does), as the initial negotiation has to take place in the background. ZRTP doesn't

Configure all your favorite protocols in one click.

**SIP SIP**

Username

Ex: john@voipphone.nat or simply "john" for no server

Password

**XMPP**

Username

Ex: johnsmith@jabber.org

Password

**Facebook**

Username

Ex: username

Password

**Google Talk**

Username

Ex: johnsmith@gmail.com or johnsmith

Password

[Not registered yet?](#)

Jitsi uses existing communications networks — Google, Facebook, Yahoo, AIM, ICQ and others — for communications.

Accounts

General

Audio

Video

Security

Events

Chat

Advanced

Call

Chat

Passwords

My Private Keys

Account:

Fingerprint: C04A952F018CD254C499C91BC559E33F00B15672

Known Fingerprints

Contact	Verified	Fingerprint

☒ Enable private messaging

☐ Automatically initiate private messaging

☐ Require private messaging

Generate a key for authentication.



have an authentication system, but because it's voice/video, you don't really need it. You can see or hear the person, so you can check their identity the old-fashioned way. It does, however, have an additional check against third parties that might try to intrude on a chat. If you hover over the lock icon, you'll see a set of four characters. While chatting with someone, check that you're both seeing the same four characters in your respective clients. If you are, then your voice and video comms are secure.

The OTR messaging is a little more complex, and requires a bit of setup. In Jitsi, go to Tools > Options then click on Security. Click on the Chat tab to enter the security configuration for OTR text chat.

The first thing you'll want to do is create a fingerprint for yourself (just as the person at the other end should create a fingerprint). A fingerprint is an authentication tool, a kind of password that certifies that who

A FINGERPRINT IS AN AUTHENTICATION TOOL, A KIND OF PASSWORD THAT CERTIFIES THAT WHO YOU'RE TALKING TO IS WHO THEY SAY THEY ARE.

you're talking to is who they say they are. Under "My private keys", select an account, then click on the Generate button next to it.

A long string of characters will be generated for your fingerprint. This will

be your authentication key. (You might also want to check the box for "Automatically initiate private messaging".)

Now you have to find a way to communicate your fingerprint to the people you want to chat with (and they to you). It can be an encrypted email, over the phone or in person. You'll need each other's fingerprints to authenticate each other.

Next, go back to the main window, choose a contact name and click on the text chat button. The texting window will pop up. In the bar, you'll see a lock icon, which will be open unless you've set it to automatically use private messaging. Click on the icon to secure the message. If the other person has an OTR-capable client, encryption will automatically kick in. Now nobody can intercept the chat.

But there's still authentication to be done. You'll get a warning message in-chat and a little amber mark on the lock icon notifying

you that that the person at the other end has not been authenticated — that is, we don't know for sure if they are who they say they are. If you click on the link in the warning message, an Authenticate window will pop up, and tell you what the other person's apparent fingerprint is. If it matches the one you have on file for that individual, you can tell the app that it matches the one given to you. The person is then authenticated.

You only have to do this once — Jitsi remembers fingerprints that have been authenticated.

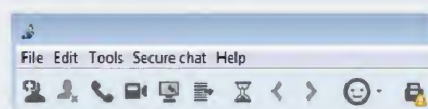
### ON MOBILES

Unfortunately for now, Jitsi is not available on mobiles. If you're looking for secure communications on mobile, however, we highly recommend Signal Private Messenger from Open Whisper Systems ([whispersystems.org](http://whispersystems.org)). Signal is a unification of RedPhone and TextSecure, which were tools for encrypted voice and text messages, respectively.

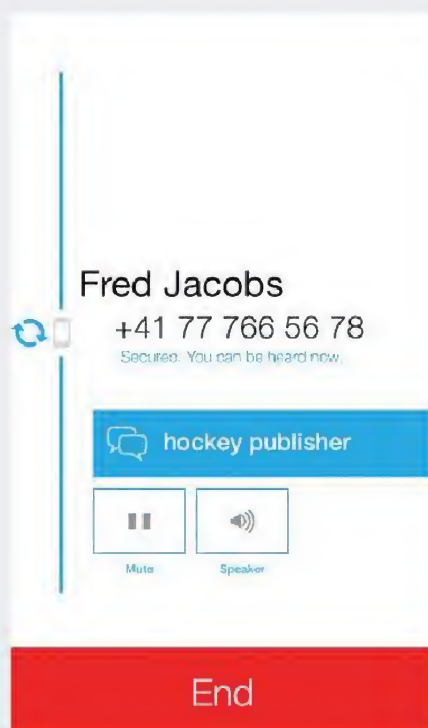
The beauty of Signal is that it uses your phone's existing number and contacts systems. With Signal, you can see a list of your contacts and can initiate a call or text chat with them at any time. These chats are fully encrypted, end to end, so nobody can intercept them. Although it uses your phone's contact lists, it's still an internet-based service. You won't be accruing any call or SMS charges from using it, though you will use data. The devices at both ends of the connection need to have Signal for the call/chat to be encrypted, however.

ChatSecure ([chatsecure.org](http://chatsecure.org)) is another popular security app for iOS and Android, though it only supports texting. It implements both OTR encryption and Tor routing, so not only can your texts not be read, it's near-impossible to trace the IP addresses of the people using it. Even if someone got hold of your phone, local encryption will prevent access to chat logs.

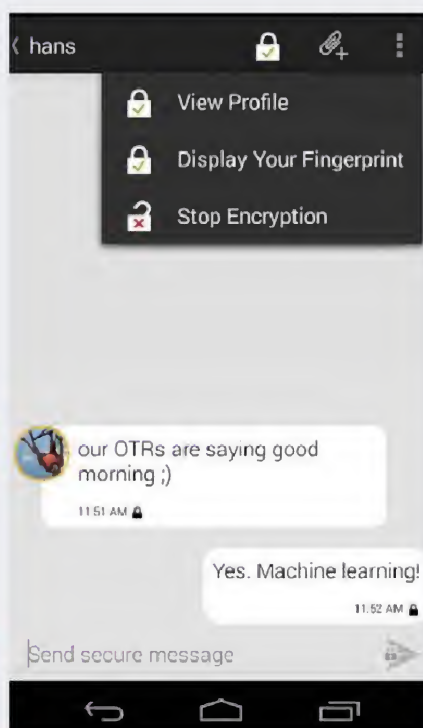
It can be a little scary at first, but if you have figured out OTR in Jitsi, you shouldn't have a problem here (in fact, it can actually talk to Jitsi, since they both use the same OTR protocol). ■



Just click on the lock icon to secure the chat.



Signal unifies the excellent TextSecure and RedPhone.



ChatSecure is about as secure as text chatting can be.



[ HOME NETWORKING ]

# Roaming at home

HOW TO MAKE MULTIPLE WIRELESS ACCESS POINTS WORK WELL IN YOUR HOME.

[ NATHAN TAYLOR ]

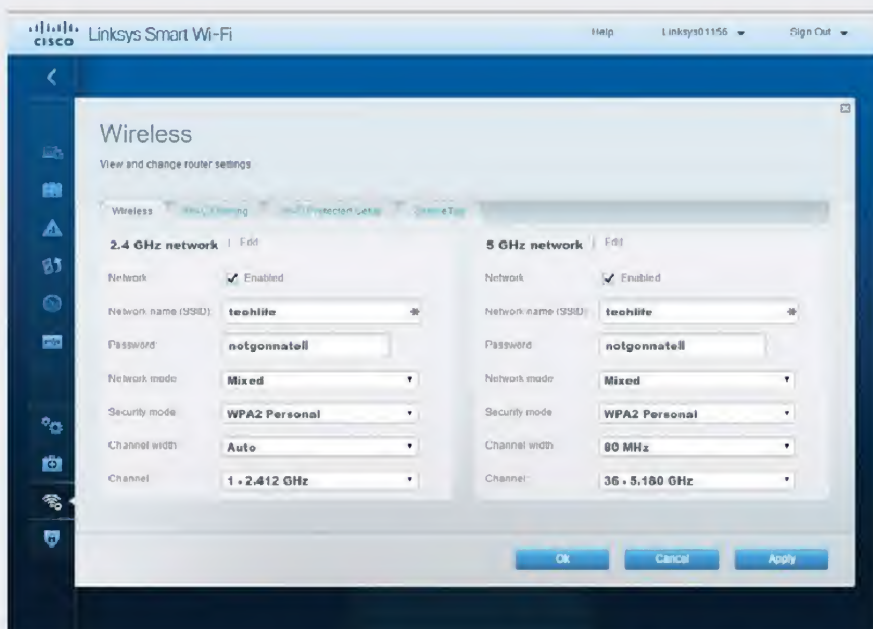
FOR A LOT of homes, wireless coverage is a major issue. No matter where you move the router, some parts of the house aren't covered by Wi-Fi. Now, the optimal solution to this problem sounds simple — you set up multiple wireless access points and link them all together with fixed Ethernet cables (forget about range extenders). That way, you can create a coverage map that reaches all the far corners of your home.

The best way to do this is to set up all the access points to have the same SSID (network name) and password, but use different radio channels. Giving them all the same network name and password means you only have to set up your clients' Wi-Fi once; giving them different channels means that they don't compete with each other for air space. In addition, if you're using multiple routers (as opposed to pure access points), only one of them — the primary router that connects to the Internet — should have DHCP enabled.

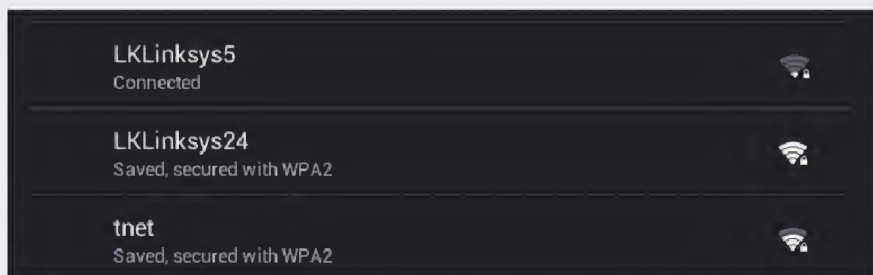
In theory, this should work pretty well, with your devices bouncing between access points based on signal strength. In theory. In reality, there are several problems.

The first is the retraining time. When you shift from one access point to another as you move around the house with your wireless device, there will be a second or two when you lose internet connectivity. For most activities, that's not a huge deal. If you're on a Skype or other VoIP call, however, it can instantly terminate the call. The same happens with some online games. Unfortunately, this isn't really solvable at the consumer level. High-end corporate access points, like those used in airports and hotels, do have seamless roaming capabilities supplied through technology like 802.11r; but you simply don't find that in many consumer devices. (It should be noted that the technology is coming — new products like the Luma, Eero and Ubiquiti UniFi support Wi-Fi mesh networks for home users, but not your everyday router.)

The other problem is that wireless clients tend to be sticky. That is, they don't like jumping from access point A to access point B, even when point B might offer a much



Set all your routers/access points to have the same name and password, but change the channel settings so that each router uses a different one. (Automatic settings might do this, but set them manually to be sure.)



Most devices will stay connected to their current access point even when there's a better option available.

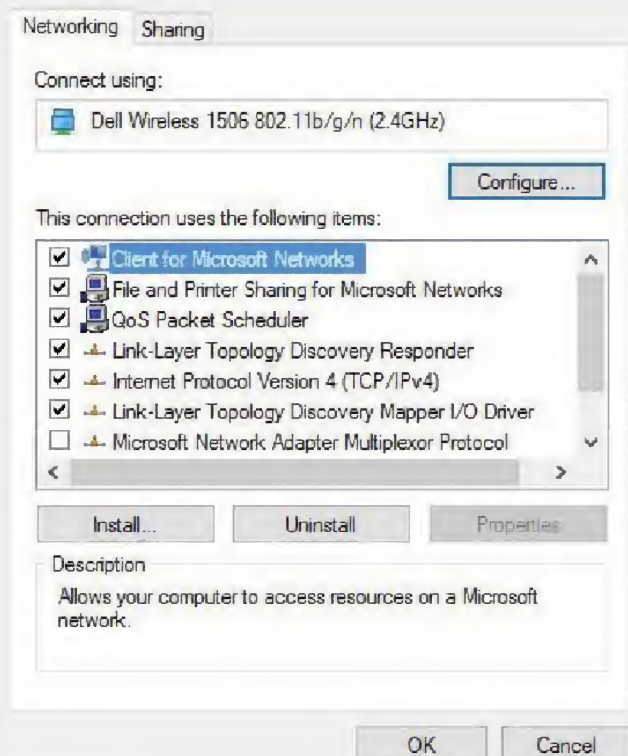
better signal. They'll stay with the access point they're currently connected to, come hell or high water. A device may have one bar on access point A and four bars on point B, but if it's already connected to A, it will stick with it until the signal is completely lost. That means you won't get the best performance out of the device. Of course, you could manually disconnect and reconnect, but that is just a pain.

WIRELESS CLIENTS  
TEND TO BE STICKY.  
THEY DON'T LIKE JUMPING  
FROM ACCESS POINT A  
TO ACCESS POINT B,  
EVEN WHEN POINT B  
MIGHT OFFER A MUCH  
BETTER SIGNAL.

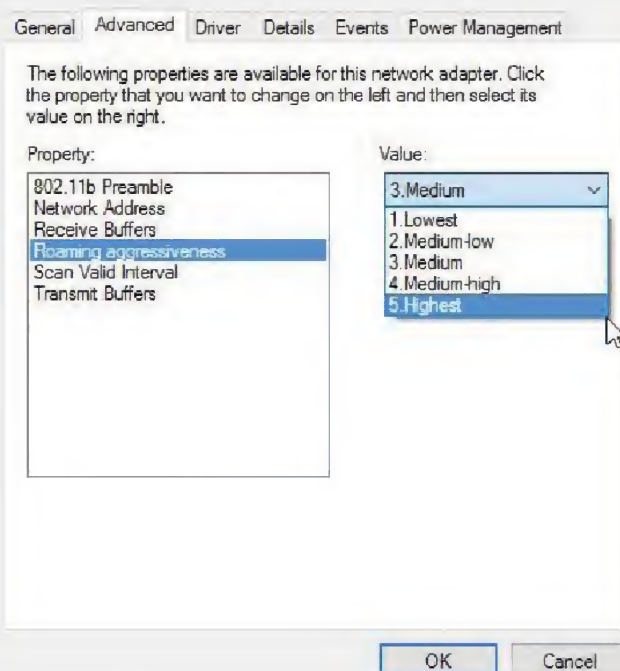
Such roaming decisions are completely up to the client devices, and most operate on the assumption that they're only dealing with a single access point and never retrain or roam if they don't have to. There

are some exceptions, however — if you're using an Android device or a PC with an Intel or Ralink wireless adapter, you can adjust the roaming 'aggressiveness' or 'sensitivity'. This modifies the threshold at which the device will

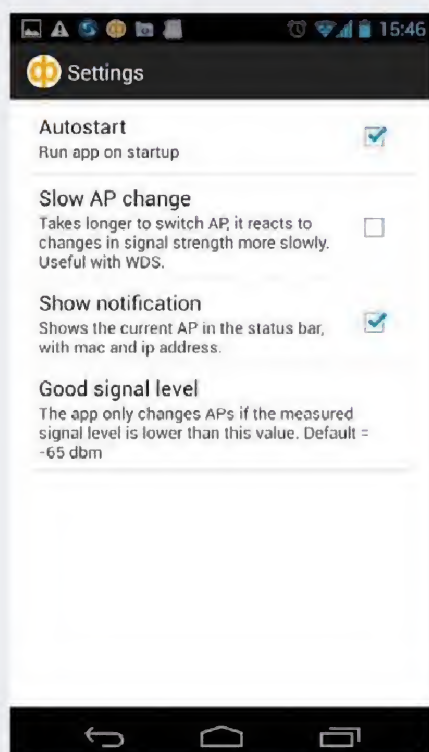




The properties window.



Crank up the aggression.

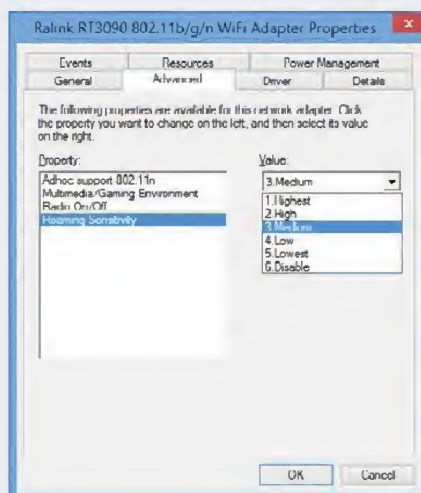


Wifi Roaming Fix is mostly an install-and-forget app, though you can change the aggressiveness of the app by modifying the Good signal level setting.

jump between access points. It will more readily dump a weak Wi-Fi connection if a better one is available.

## PCs

So if you have a PC with an Intel or Ralink adapter, you'll need to dig deep into the advanced adapter properties. In Windows 10, go to Start > Settings > Network & Internet.



Ralink calls it "Sensitivity."

Scroll down to the bottom and click on "Change adapter options", which will show you a list of your current network adapters. Right click on your wireless adapter and select Properties.

Now click on the Configure button just under the adapter name. This will bring up the specific adapter driver and properties window. Then click on the Advanced tab. You'll see a field called "Roaming aggressiveness" (or "Roaming sensitivity" on Ralink adapters). Click on it, then set the aggressiveness/sensitivity to its highest setting.

This will increase the frequency with which the device hops from one access point to another, hopefully ensuring that you always have the strongest signal.

## ANDROID DEVICES

Although Android has no integral aggression setting, there is an app called Wifi Roaming Fix from Heleron that serves much the same function. It's free and available on Google Play.

It's very simple to use and runs in the background on your Android system. It requires that your network be configured the way we described at the beginning of this article (all access points have the same SSID and password but use different channels). If you're configured that way and are connected to any of the access points, you can just run it and then let it go. It will take care of the rest.

The only default setting you might want to change is the Good signal level setting. Tap on the options menu on the top right and go into the settings. Then tap on the Good signal level field to change it. This is the threshold at which the app will start looking for a better access point. It defaults at -65dBm, which means if the signal gets worse than that, it will try look for a better access point. You can make it more aggressive by changing the number to, say, -50dBm; or you can make it less likely to jump access points by changing it to -80dBm for example.

The app has an algorithm that prevents it from hopping between access points of a similar strength, and we've found it to be rock solid in testing. It's absolutely worth installing if you have multiple access points set up in your home. ■





[ PHOTOGRAPHY MASTERCLASS ]

# Core photography skills: dynamic range

**KNOWING HOW DYNAMIC RANGE WORKS WILL HELP YOU MAKE BETTER EXPOSURES.**

[ MARCUS HAWKINS ]

## WHAT IS DYNAMIC RANGE?

Dynamic range is a way of describing the range of light intensities from the darkest shadows to the brightest highlights. It can be measured in Exposure Value (EV for short) or 'stops'. Some scenes have a wide dynamic range, meaning that there is a significant difference in exposure value between the shadows and the highlights — such as shooting a silhouette at sunset — while others have a much narrower range of brightness levels. When you take a picture, there are actually two dynamic ranges to consider: the dynamic range of the scene you're capturing and the dynamic range of the camera's imaging sensor.

## AREN'T THEY THE SAME?

The sensor inside your digital camera can only record a fixed dynamic range in a single exposure. As long as the difference in brightness between the darkest and lightest

areas of a scene falls within this dynamic range, you'll be able to record detail in both areas simultaneously. For example, if a camera sensor has a dynamic range of 8 EV and the difference between the shadows and highlights is 6 EV, then you'll be able to capture detail in all areas of the scene.

However, if the dynamic range of the scene or subject exceeds that of the camera sensor, you'll end up with a picture where the shadows are completely black or where the highlights have 'blown' and become totally white — and sometimes both.

## DO ALL CAMERA SENSORS HAVE THE SAME DYNAMIC RANGE?

No, cameras vary in their ability to handle dynamic range. The greater the dynamic range of the camera, the more info it'll be able to capture. For instance, the Nikon D610's dynamic range has been measured at between 13 and 14.4 EV at ISO 100.

## HOW DO I KNOW IF THE CAMERA CAN HANDLE A SCENE'S DYNAMIC RANGE?

In the days of film photography, this was a fiddly process. You'd have to take exposure measurements from the darkest and the brightest parts of the scene, calculate the exposure value difference between the two, then check if the film stock you were using was capable of capturing this range of light intensities and how to set the exposure to do just that.

With a digital camera, you can simply review the brightness histogram on the rear screen. This allows you to instantly see whether the dynamic range of the scene (represented by the histogram) fits within the dynamic range of the sensor (represented by the width of the graph). If the histogram is 'clipped' at the edge of the scale, you may lose picture detail — either in the shadows (if it's clipped on the left) or in the highlights (if it's



## EXPLAINED: WHAT THE HISTOGRAM IS TELLING YOU

Learn how to read a histogram properly. It shows you the difference between the dynamic range of the scene and the dynamic range of the camera.

### GRAPHICAL REPRESENTATION

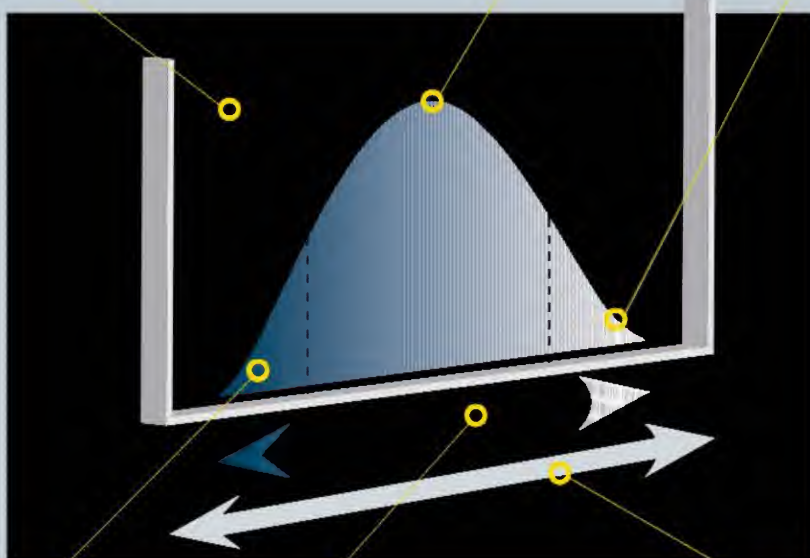
This shows the tones, from pure black (left) to pure white (right). The histogram's height shows the number of pixels registered at each brightness level.

### VARIETY OF SHAPES

'Mid-tones' and subjects of average brightness are concentrated in the middle. Histogram shapes vary — they won't all be a perfect dome.

### ON THE RIGHT

The right side is for the bright areas of a picture. If part of the histogram is clipped on the right, those areas of the picture will be rendered as detail-free white.



### ON THE LEFT

Dark areas correspond with the left of the graph. If part of the histogram is cut off or clipped on the left, those areas in the picture will appear pure black.

### SCENE'S DYNAMIC RANGE

The width of the histogram represents the dynamic range of the scene. Stretching the full width means the full range is encompassed in the photo.

### CAMERA'S DYNAMIC RANGE

The width of the graph indicates the dynamic range of the camera sensor. If the histogram doesn't fit, then you may need to fix this.

clipped on the right). You may need to adjust the exposure to squeeze the scene's dynamic range into that of the sensor.

## CAN I USE EXPOSURE COMPENSATION TO IMPROVE A PHOTO'S DYNAMIC RANGE?

No: your camera's exposure compensation feature only affects the overall brightness of an image. It enables you to shift the histogram left or right along the scale to ensure that either the highlights or the shadows aren't clipped, but you won't be able to increase or decrease the dynamic range itself.

If the dynamic range of a scene is too wide to capture in a single exposure — with both the shadows and the highlights being clipped — you'll need to decide where it's better to

capture detail, and adjust the exposure accordingly. It's usually preferable to 'expose for the highlights' — in other words, to reduce the exposure to ensure the brightest areas aren't clipped. However, there are some camera settings that can help you improve the dynamic range.

## WHICH CAMERA SETTINGS ARE THOSE?

You'll get the best dynamic range performance from the sensor if you shoot at the lowest ISO setting using your camera's raw file format. Raw files hold more information than JPEGs and they offer more exposure latitude, making it easier to pull back detail in pictures that are either too bright or too dark.

## CAMERA SETTINGS EXPLAINED

There are ways to capture a wider dynamic range as you shoot.



### SHOOT IN RAW

Raw files are typically captured at 12 or 14 bits compared with the 8 bits of a JPEG. One of the many benefits of this is increased headroom when editing your pictures, enabling you to reveal lost shadow and highlight detail and expand dynamic range.



### USE DYNAMIC RANGE EXPANSION

Camera manufacturers include their own bespoke dynamic range expansion feature, such as Canon's Auto Lighting Optimizer here. These are good at bringing out shadow detail, and you can adjust the strength if it looks unnatural.



### CHECK THE HISTOGRAM

When you view the histogram, bear in mind that what you see isn't what you get when you're shooting raw files. The histogram and the image preview are a JPEG representation, based on the settings used when the image was captured.



## HOW TO USE THE BUILT-IN HDR MODE

Here are some of the typical options on offer in HDR mode...



### ADJUST THE DYNAMIC RANGE

The camera will take two or three pictures in quick succession, then blend them into a single JPEG image. You can leave it up to the camera to automatically decide the difference in exposure value between each frame, or you can adjust this yourself. The higher the EV value, the stronger the effect.



### ADJUST THE HDR PROCESSING

Because it brightens shadows and squashes highlights, HDR mode can leave pictures looking a little flat. However, you may be able to tweak the way the final image is processed by the camera, boosting colours, contrast and edge definition to give the final image a more *painterly* or graphic look.



### SAVE THE ORIGINALS

The processed HDR image will be saved as a JPEG. However, some cameras give you the option to save the original source files, as well, allowing you to blend the images later in software. The Canon 5D Mark III even enables you to save the raw files, for more precise control.

Most cameras offer an automatic dynamic range enhancing mode, such as Nikon's Active D-Lighting or Canon's Auto Lighting Optimizer. These brighten up shadow areas for a boost in the recorded dynamic range, although they only work with JPEGs.

High Dynamic Range (HDR) photography enables you to substantially increase the effective dynamic range. Rather than trying to squeeze the dynamic range of the scene into one exposure, HDR requires several identical images to be recorded at different exposure value levels. These images are then combined in special HDR software, such as Photomatix ([www.hdrsoft.com](http://www.hdrsoft.com)), to give a much wider dynamic range than is possible using a single exposure. Some cameras have an HDR mode that can carry out this process automatically for you.

HDR is an easy effect to overdo. If it's not your cup of tea, you will have to use an alternative technique to reduce the dynamic range when faced with a high-contrast scene.

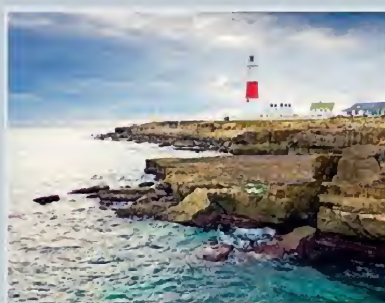
### WHAT TECHNIQUES ARE THOSE?

Flash and reflectors can brighten up shadows where detail would otherwise be lost.

Landscape photographers use neutral-density graduated filters to do the reverse, ensuring detail is not lost in bright areas. ND grads are clear at the bottom and dark at the top; by positioning the dark half over a bright sky, you can bring its exposure value closer to that of the darker foreground. These days, landscape photographers are just as likely to take two photos of a scene — one that's exposed to retain detail in the sky and another which has been exposed to retain foreground detail — then combine the two photos in Photoshop or similar software.

## SHOOTING ADVICE FIXING DYNAMIC RANGE PROBLEMS

Techniques to cope with dynamic range issues...



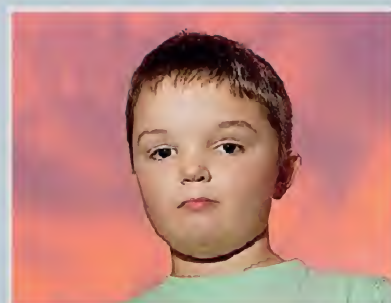
### LANDSCAPES

Typically, you'll end up with two peaks on the histogram: the darker foreground and the brighter sky. You may be unable to capture detail in both areas using a single exposure. An ND grad filter will reduce the intensity of the sky and bring it within the camera's dynamic range.



### SUN AND SHADE

Sunny conditions can lead to high-contrast pictures, where the difference between brightly lit areas and those in shade will be too large for the camera's sensor to squeeze into a JPEG image. Switch to shooting raw files, so you can rescue detail from 'clipped' areas when you process the pictures on your computer.



### BACKLIT PORTRAITS

When you shoot in front of a bright background, you may find that, if you expose the face properly, the background will be too bright. Expose the background properly, and the person will be in silhouette. To fix this, expose for the background and use a flash or reflector to lighten the face.



### DAWN AND DUSK

The sky can be much brighter than the rest of the scene at each end of the day. The previous tricks can help to cope with the contrast, but may not be enough. The solution is to use exposure blending or HDR photography, taking a sequence of different exposures and combining them in software later. ■





The home of technology

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[ SMART HOME MASTERCLASS ]

# Control your smart home with your smart watch

WHAT THE APPLE WATCH AND ANDROID WEAR CAN DO AROUND THE HOME, WHETHER YOU'RE THERE OR NOT.

[ JENNETH ORANTIA ]

IF YOU'RE STILL looking for a reason to invest in a smart watch, perhaps the ability to use it as a remote control for your various smart home gadgets will be enough to sway you. Now that smart watches have become more popular, developers are increasingly building apps that extend the functionality of their smartphone apps to the wrist, and quite a few of these are connected to smart home gadgets. This means you can do things like turn on the lights, control music playback and turn various appliances on and off with just a couple of taps from your wrist.

Of course, you'll need to have the right mix of smartphone, smart watch and smart home gadget to make this all happen. Here's what's possible with the two main smart watch platforms: Apple's watchOS and Android Wear. Note: to install any of these apps, you'll need to install the corresponding smartphone app to your device and it will automatically transfer the equivalent version to your smart watch.

## WATCHOS

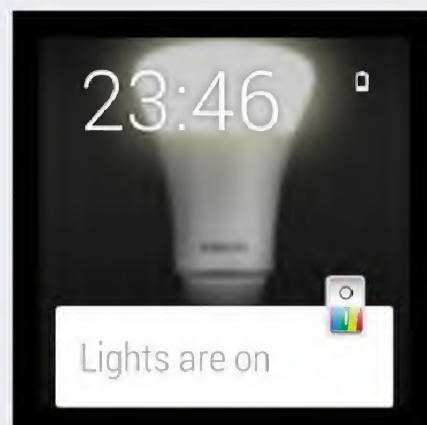
The first app you should install on your Apple Watch is the powerful DO Button. This is a simplified version of the IFTTT (If This, Then That) app that gives you easy access to a variety

of 'recipes' (or automated tasks) that work across a variety of web services and smart home gadgets, including Philips Hue, LIFX, Belkin WeMo, Twitter and Evernote. There are ready-made recipes in the library to do things like dim your Hue lights, toggle your LIFX lights on/off and toggle a WeMo switch, and you can also create your own recipes from scratch.

If your smart light of choice is the Philips Hue, you'll be happy to hear that there's an Apple Watch version of the Hue app for controlling your Hue smart lights. When you set it up initially from the iPhone app, you can select up to 10 lighting scenes to import to the Hue app on the Apple Watch, including an 'all off' mode. However, you can't adjust the brightness of any of the lights or change colours.

To take greater control of your Hue lights, the iConnect Hue app (\$7.99) is a far better option. This lets you access all of your lights individually to adjust brightness and colour, and you can also organise your lights into groups and access a nifty sleep timer that gradually dims the lighting over a set time period.

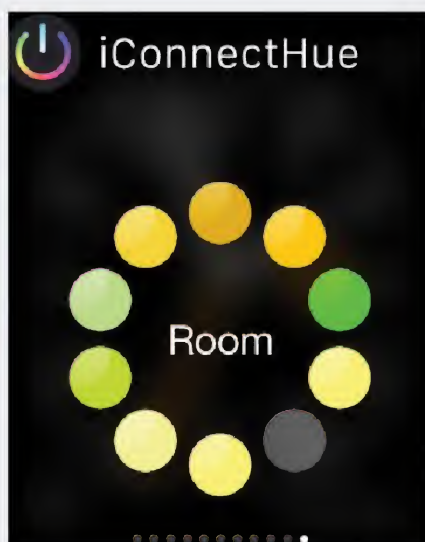
Alternatively, you can upgrade your Hue setup to the Philips Hue Bridge 2.0 (the bit that



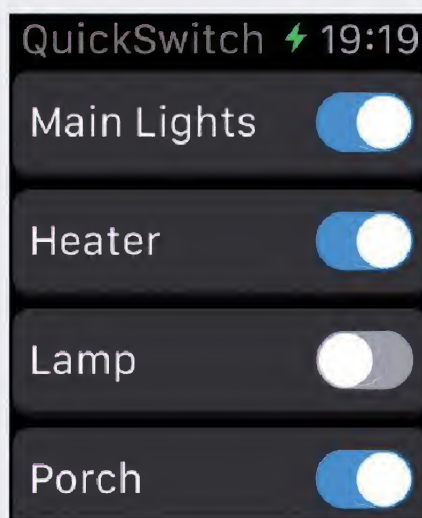
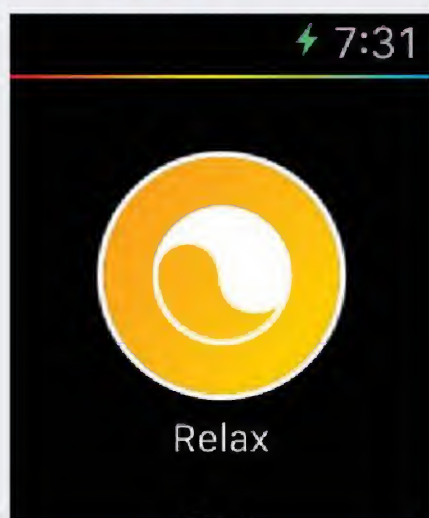
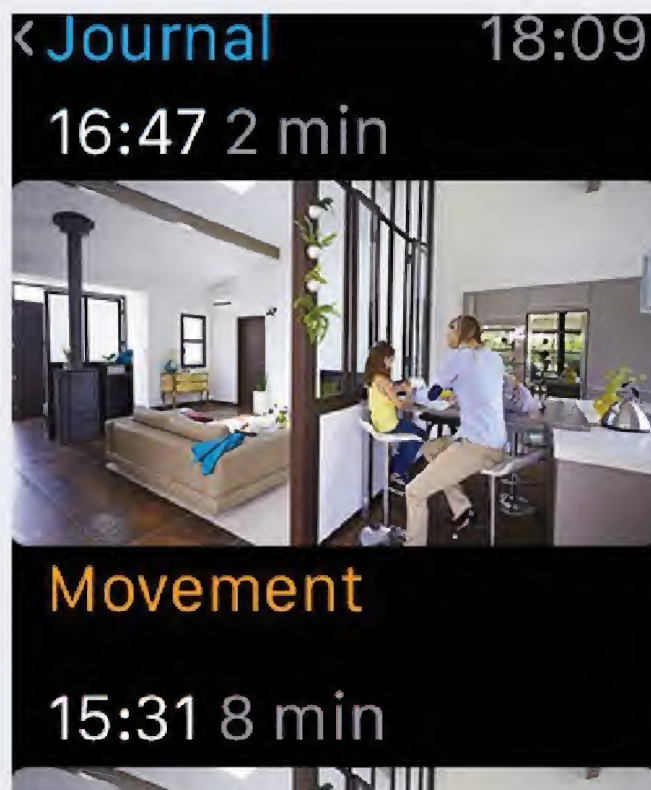
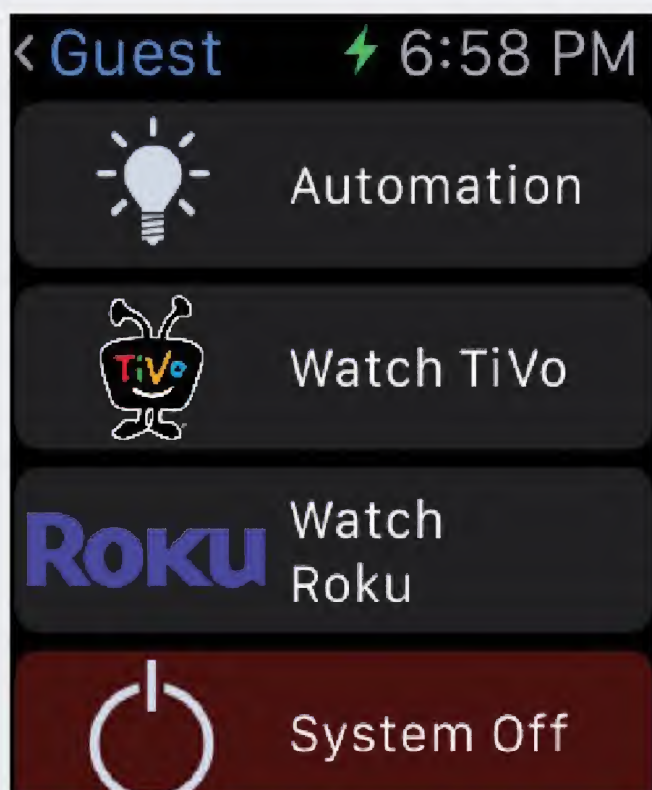
is hardwired to your Wi-Fi router), and this adds Apple HomeKit functionality. The benefit of doing this from an Apple Watch perspective is that you'll be able to use Siri voice commands to control your Hue lights from your wrist, with natural language commands at your disposal such as "Dim all lights to 30%" or "Turn off all the lights in the living room".

If you're a LIFX user, there's a corresponding Apple Watch app from the official LIFX app that's a little more robust than the Hue app, letting you toggle your lights on and off, swipe between individual bulbs, and adjust brightness.

Belkin is yet to produce a smart watch version of its WeMo app yet, but that doesn't mean you can't control these devices from an Apple Watch. As well as the aforementioned DO Button, which supports WeMo, there are a handful of third-party WeMo apps that have corresponding Apple Watch apps. This includes the \$2.99 QuickSwitch, which lets you control any of your WeMo lights or switches from the Apple Watch. In some ways, it







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OF COURSE, YOU'LL NEED TO HAVE THE RIGHT MIX OF SMARTPHONE, SMART WATCH AND SMART HOME GADGET TO MAKE THIS ALL HAPPEN.

actually works better than the official version of the app, as you can group multiple WeMo devices together into a single group (i.e. the living room) and turn everything in that group off with a single tap.

Another app that's worthy of your wrist is Simple Control. It's on the pricey end of the spectrum at \$14.99, but it's a worthwhile investment as it enables you to control thousands of AV devices from your Apple Watch, including smart TVs, Blu-ray players, Apple TV and Sonos. The initial cost above includes the ability to control three devices, but if you want to control more, you'll need to plump for an ongoing subscription,

starting at US\$19.99 per year for three additional devices.

From a home security perspective, the Withings Home HD Video Camera is the only device available in Australia with a corresponding Apple Watch app. From the app, you can tap into a live video feed, access the two-way audio, and receive a variety of alerts. If the video camera is set up in the baby's room, there's also an option to activate the lullaby feature and turn on a night light.

#### ANDROID WEAR

There aren't as many smart home apps available for Android Wear, but there's enough

to get you started. As with the Apple Watch, the powerful DO Button is available for controlling a variety of smart home gadgets from your wrist, including Belkin WeMo, Philips Hue and LIFX. LIFX also has an Android Wear app that offers similar functionality to the Apple Watch app.

For Philips Hue users, the Hue Control app gives you advanced control of your lighting system, such as the ability to turn all of your lights on at once, or just a specific group or room. You can also adjust the brightness and colour of the lights from within the app, and it even supports voice commands.

The Tasker automation app, offers even more powerful capabilities if you don't mind doing a bit of tinkering, and there's a corresponding app called WearTasker that lets you access all of your tasks from an Android Wear watch. From a smart home perspective, this enables you to do things like automatically turn on your Hue lights or WeMo appliances whenever your phone connects to your home wireless network (and vice versa). ■



[ TECH FRONTIER MASTERCLASS ]

# Make your phone wirelessly charge for under \$4

HERE'S HOW TO ADD WIRELESS CHARGING TO SOME SMARTPHONES FOR AS LITTLE AS \$4.

[ DARREN YATES ]

SMARTPHONE MANUFACTURERS ARE always on the look-out for new features to pump up their latest models and entice consumers to blow the cobwebs from their wallets. One of the latest high-tech arrivals is wireless charging, the technique that charges your smartphone by you simply placing it on a charging pad, which induces energy to flow into the battery with no connecting wires.

But the thing is, you don't really need a new phone to get wireless charging — it may well be built into your existing phone and, if not, a simple low-cost DIY addition could be available. We've done some investigating this month and forget the idea of wireless charging costing up to \$50 — we've found how you could do it for as little as \$4.

## NOT PERFECTION

Wireless charging has come along a reasonable distance in the last couple of years, but it's not yet as fast or as efficient as plugging in the charge cable straight into your phone. In fact, the best efficiency figures we've seen so far are around 70%, which means for every watt of electrical power you feed into the charging mechanism, only 0.7-watts at best ends up in the phone's battery. Lower charge rates also mean longer charge times and the extra heat generated by wireless charging won't necessarily do your phone's battery much good, either.

But the convenience of wireless charging has plenty of appeal, so we decided to take an aging but much-hacked Samsung Galaxy S3 smartphone and see what we could do to give it some wireless charging love. In the end, what we found can also be adapted to many recent phones.

## CHARGER IN TWO PARTS

The technology behind wireless or 'inductive' charging goes back 200 years to English scientist Michael Faraday, who discovered that if you wind two separate coils of wire around a lump of iron and pulse an electric current into

The charge pad coil electromagnetically couples to one similar in your phone

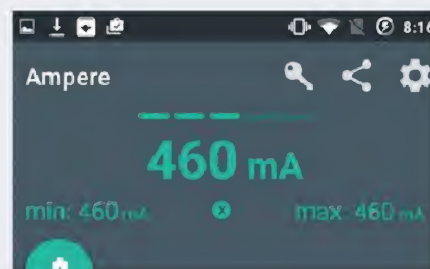


the first coil, a similar pulse is induced in the second, despite there being no direct electrical connection between the two. This 'transformer' concept is the basis behind wireless charging, except here, there's no lump of iron required. Instead, we just have two flat coils — one inside the phone and one in the charging pad you rest the phone on.

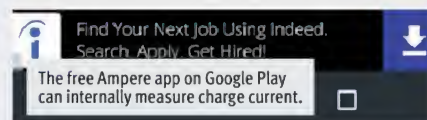
The problem is that only late-model phones typically have the charging coil built-in, not to mention which type of coil is required, given the competing standards on the market.

## WIRELESS CHARGING STANDARDS

The wireless charging industry for phones is currently a two-horse race between Rezence



Status: Charging  
Plugged: AC charger  
Level: 59%  
Health: Good  
Technology: Li-ion  
Temperature: 38.2 °C  
Voltage: 3.893 V  
Model: GT-I9300  
Android version: 5.1.1  
Build ID: LMY48G



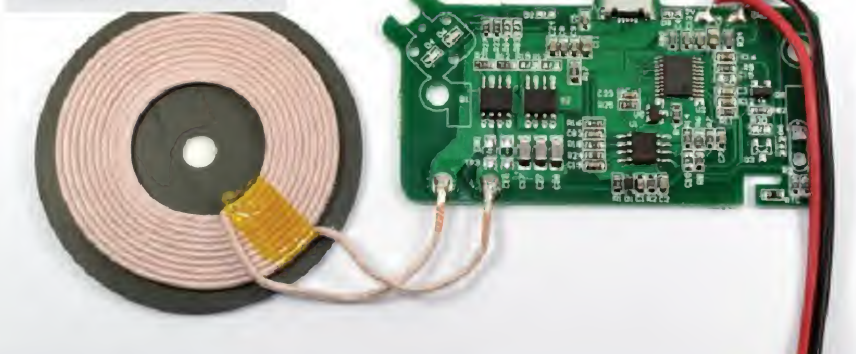
([www.rezence.com](http://www.rezence.com)), a product of Wireless Power (A4WP) and Power Matters Alliance (PMA); and Qi, developed by the Wireless Power Consortium ([www.qiwireless.com](http://www.qiwireless.com)).

Wireless charging has applications that go way beyond mobile phones, but right now, the WPC all but owns the smartphone market with ASUS, Motorola, Sony, Samsung, HTC, Huawei, LG and Nokia all signing up to the Qi standard. It also happens to be the standard the vast majority of low-cost DIY phone coils and charging pads support.

## WIRELESS CHARGING COILS

While a number of new-generation Android phones do feature built-in charge coils, not all

Most wireless charger pads consist of a small circuit board and circular coil.





External charge-receiving coils plug into your phone's microUSB port.



This internal receiving coil taps into the Galaxy S3's internal contacts.



do and there are plenty of popular late-model phones, such as Samsung's Galaxy S3, S4 and S5, that don't — but they do have the electrical pin contacts to enable them. Brewing online are wireless-charging receiver pads designed to either plug into the microUSB port of your mobile device or fit inside its back cover (is a charging receiver that plugs into microUSB slightly weird? Discuss.) We picked up one of each type with the S3 in mind.

#### RECEIVING UNIT #1 — INTERNAL

Starting with the internal S3-specific receiving coil, it's rated for a 5VDC input voltage (standard USB) and claims to output up to 0.8-amps of current. The thin envelope has two pin contacts on one edge to match the S3's internal accessory contacts, and inside the envelope, there's a thin flexible circuit board plus receiving coil. Installation is fairly straightforward — align the envelope pins with the S3 contacts and put the cover back on (although this takes a bit of effort). After that, your Galaxy S3 is wireless charge-ready. We found our receiver coil on eBay for less than \$4, including shipping.

#### RECEIVING UNIT #2 — EXTERNAL

The second receiver unit is about the same size as the internal one but features a flexi-ribbon cable and a plastic-moulded microUSB connector on the end. Slot the connector in, loop the charging coil underneath the phone and that's about it. It's rated at 5VDC input voltage also but claims charge current outputs of between 0.8 and 1.0 amps.

#### WIRELESS CHARGING PADS

That's half the job done — the other half is the charging pad your phone sits on. We picked up three different options, all costing less than \$7 on eBay. Before you laugh too loud about the source of our components, the technology inside most wireless charging devices is comparatively simple as things go, not to mention eBay being a great way to avoid the "Australian Technology Tax".

#### PAD #1 — WIRELESS CHARGING PAD

The simplest option we saw was dubbed the "wireless charging pad". It looks like a hockey puck, but only a few millimetres high and comes in a range of colours. It features just a single microUSB port for your phone charger cable. We tested this first with the external receiver coil and measured the electrical current used by the charging pad with a small in-line USB volt/amp-meter, peaking at 1.18 amps. Using the free Ampere app from Google Play, this corresponded to a charge current of 0.46 amps (460mA) into the battery, although as it turned out, this was the highest reading the app gave us on any receiving coil/charging pad combination, internal or external.

Using the internal receiving coil, the current draw through the USB cable was slightly lower at 0.95-amps, still appearing as 0.46-amps on the Ampere app.





As a comparison, simply plugging the USB cable straight into the phone showed 0.95 amps on the USB volt/amp meter and 1.0 amps on the Ampere app.

### PAD #2 — WIRELESS CHARGER

The second unit was just labelled “wireless charger”, cost \$6 and features red power and blue indicator LEDs, the latter lighting up when a charge-ready phone is detected.

Again, the charge rate was measured by Ampere as 0.46A with the internal receiver pad. Using the external receiver, the highest USB current rate to the charging pad was 0.95 amps, with the Ampere app again saying 0.46 amps.

### PAD #3 — BARE CIRCUIT BOARD

If you don't mind a bit of DIY, this bare circuit board option was the cheapest at just \$3 and the most interesting from the viewpoint of showing how these devices actually work. It drew 1.03 amps maximum from the USB power adapter and again, the Ampere app kept to the 0.46 amps script via the external receiver. With the internal receiver coil, things were roughly the same, hitting 0.99 amps of current through the USB cable.

### WHAT'S INSIDE

The barebones charger reveals a small circuit board with a flat wire coil about 45mm in diameter. That circuit board contains a tiny, cheap 16MHz/8-bit SGS-Thomson STM8S103 microcomputer chip called a microcontroller,

some sensing circuitry and a couple of fast electronic switches called MOSFETs (metal-oxide silicon field-effect transistors for those wanting the techy name).

Remember before how we were talking about Faraday discovering the effects of electricity pulses? These MOSFETs provide consistent electric pulses around 200,000 times per second that enables electricity to appear to jump from one coil of wire in the charger pad to another in the phone. As a side note, all of these electronic components are incredibly cheap to buy (for example, the 16MHz microchip can be had for around 50cents), so if you're being asked to pay \$40 for a charging pad, it's probably not the electronics you're paying for!

### WHY WIRELESS CHARGING IS FUSSY

One of the things we found during testing, and what we think is one of the issues with many existing wireless charging technologies, is that, regardless of charging coil and pad combinations, obtaining maximum charge

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IF YOUR PHONE ALREADY  
HAS A QI CHARGING COIL  
BUILT IN, THE ONLY THING  
YOU NEED IS A QI-STANDARD  
CHARGING PAD.



This compact wireless charging pad sells for under \$4 on eBay.

current is a somewhat fussy and sensitive affair. With a USB volt/amp-meter in line with the USB cable to the charging pads, it only took a small movement of the phone to alter the charge current by a considerable amount. What's more, the blue LEDs the majority of these charging pads offer as indicators can only show wireless charging is active – not the actual charge current rate. Given charge currents we saw varied over a five-fold range, just a centimetre or so can be the difference between your phone being fully charged by morning or just half-charged.

The reason for all of this fussiness comes back to Faraday and his transformers again. Those coils seem to need near-on perfect alignment to gain the highest charge current. The less they're aligned, the less current is induced in the phone receiving coil and going to the battery.

The solution used in newer charging pad designs is to incorporate multiple coils to



The “wireless charger” pad has a microUSB port for power in.



The S3 takes a wireless charge through its internal wireless coil.





Wireless charging relies on electromagnetic induction (Source: TDK).



Energy is transmitted from the Tx coil to the Rx coil by the electromagnetic induction between them.

provide more chances of hitting the alignment target. But arguably the most reliable solution so far looks to be incorporating magnets into the charging pad and phone to *pull* the phone into correct alignment — this way, you only have to get the phone somewhere near the right spot and magnetism does the rest.

Yet another issue is the distance between the two coils — the greater the vertical height or distance between the coils, the less *coupling* between them and the lower the charge current. Still, these are issues the wireless charging industry is looking to overcome.

#### PHONES WITH BUILT-IN QI COILS

If your phone already has a Qi charging coil built in, the only thing you need is a Qi-standard charging pad. You just plug your charge cable into the charge pad instead of your phone, place your phone on top of the pad, line it up and away you go.

While no Apple phone includes built-in wireless charging tech as yet, there's a decent list of late-model Android phones, tablets and wearables that do:

- Google Nexus 4/5/6/7
- HTC 8X/Droid DNA
- LG Optimus G Pro/G3
- Motorola 360
- Nokia Lumia 735/830/920/928/930/1520
- Samsung Galaxy S6/S6 Edge/S6 Edge+/Note 5
- Sony Xperia Z3V/Z4V

#### IS WIRELESS CHARGING SAFE?

A key concern over wireless charging is whether or not it's safe for your phone. One of the side effects of wireless or 'inductive' charging is that the charging coils can get decidedly warm. Those coils are typically next to the battery and the one thing lithium-ion batteries dislike more than anything else is heat.

It was an extreme test but we set the Galaxy S3 on full brightness with the internal Qi charging coil and placed it on the big white "wireless charger" pad opposite. While Ampere said it was charging at 0.46-amps, the S3's screen and CPU were consuming at least that, if not more, so that the battery percentage didn't budge and after about 30 minutes or so, the internal phone temperature had reached, according to Ampere, an unhealthy 51.2 degrees Celsius.

We tried again once the phone had cooled down to room temperature (22 degrees Celsius), this time with the phone in standby (screen off) mode. After 20 minutes, the temperature hovered at a considerably cooler 38.2 degrees Celsius, but it rose up over 40 degrees Celsius within a few minutes of leaving the screen on. For comparison, we also ran the



same standby-mode test using wired charging with 1.0-amp current — after 15 minutes, the internal temperature was just 30.5 degrees Celsius.

In each test, the initial battery capacity was between 35% and 60% to ensure the phone was in "high current" charging mode.

Now, admittedly, this is just a one-phone test, so your mileage may vary — but if we ever use wireless charging in the future, we'll do it with the phone in standby mode, if not off.

#### IT WORKS, BUT...

Bottom line, wireless charging does work — but we found it neither as fast nor as efficient as wired charging. The DIY coils we tried appeared limited to around a 0.5-amp charge current in practice on the Galaxy S3, or about half what we could achieve by just plugging the charge cable straight into the phone. To keep internal temps down, we recommend making sure your phone is either in standby mode or off while charging. We'd also suggest an in-line USB volt/current meter to help in phone alignment to maximise the charge currents. ■





# BUYER'S GUIDE

YOUR READY RECKONER TO THE BEST TECHNOLOGY PRODUCTS



The *TechLife* team finds the best budget, value and performance products, and the latest releases in the top technology categories. If you believe there are other products that deserve the title in any of the tech categories, let us know and give us your reasons why in 50 words or less. Equally, if there's a hot new product that's worthy of attention, we want to know. Send your email to [techlife@futurenet.com](mailto:techlife@futurenet.com).

ADSL ROUTERS  
(WITH MODEM)

 <b>[ BEST BUDGET ]</b> <b>Netgear DGN2200</b> \$99   <a href="http://www.netgear.com.au">www.netgear.com.au</a> It's only 802.11n, but it has the basics you need plus an excellent, easy-to-use interface.	 <b>[ BEST VALUE ]</b> <b>TP-Link Archer D7</b> \$170   <a href="http://www.tp-link.com.au">www.tp-link.com.au</a> The UI is a bit no-frills, but once set up, this is a very solid AC1900 router for a price well below the average.	 <b>[ BEST PERFORMANCE ]</b> <b>ASUS DSL-AC68U</b> \$300   <a href="http://www.asus.com/au">www.asus.com/au</a> It ain't cheap, but if you want it all, this 802.11ac unit is fast and packed with handy enthusiast features.	 <b>[ NEW ON SHELF ]</b> <b>Netgear Nighthawk D7800</b> \$549   <a href="http://www.netgear.com.au">www.netgear.com.au</a> This 'wave 2' 802.11ac ADSL router offers new top Wi-Fi speeds, but will require compatible clients to get there.
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BROADBAND ROUTERS  
(NO MODEM)

 <b>[ BEST BUDGET ]</b> <b>Netgear WNR2000</b> \$70   <a href="http://www.netgear.com.au">www.netgear.com.au</a> It's only 802.11n, but for around \$70, this four-port router will cover the basics.	 <b>[ BEST VALUE ]</b> <b>TP-Link Archer C7</b> \$150   <a href="http://www.tp-link.com.au">www.tp-link.com.au</a> This modemless version of the D7 (above) has all the basics you'll need to set up a 1,300Mbps AC network.	 <b>[ BEST PERFORMANCE ]</b> <b>ASUS RT-AC87U</b> \$310   <a href="http://www.asus.com/au">www.asus.com/au</a> This full-featured unit is overflowing with options and settings, plus it has super-fast wireless.	 <b>[ NEW ON SHELF ]</b> <b>Linksys EA8500</b> \$400   <a href="http://www.linksys.com/au">www.linksys.com/au</a> The latest 802.11ac router from Linksys adds MU-MIMO to the mix, which should mean faster speeds for all your devices.
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NETWORKING ACCESSORIES

 <b>[ BEST WIRELESS EXTENDER ]</b> <b>Netgear EX6200 Wi-Fi Range Extender</b> \$129   <a href="http://www.netgear.com.au">www.netgear.com.au</a> This AC extender is capable of speeds up to 867Mbps, has great range and can host storage via its USB 3.0 port.	 <b>[ BEST WIRELESS BRIDGE ]</b> <b>Linksys WUMC710</b> \$140   <a href="http://au.linksys.com">au.linksys.com</a> This 802.11ac bridge is a great way of linking up to four wired network devices to a 1,300Mbps AC network.	 <b>[ BEST POWERLINE ADAPTER (BUDGET) ]</b> <b>Netcomm NP507</b> \$140   <a href="http://www.netcomm.com.au">www.netcomm.com.au</a> These powerline plug adapters are a little big, but include socket passthrough and fantastic speeds.	 <b>[ BEST POWERLINE ADAPTER WITH WI-FI EXTENSION ]</b> <b>Netcomm NP508</b> \$145   <a href="http://www.netcomm.com.au">www.netcomm.com.au</a> If you want to add wireless extension onto powerline capabilities, this topped our 2.4GHz Wi-Fi speed tests.
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NETWORK ATTACHED  
STORAGE DEVICES

 <b>[ BEST BUDGET ]</b> <b>Lenovo Iomega IX2</b> \$125 (DISKLESS)   <a href="http://www.lenovo.com">www.lenovo.com</a> You'll need to BYO drives, but this very affordable two-bay NAS offers impressive features for the price.	 <b>[ BEST VALUE ]</b> <b>ASUSTOR AS-202TE</b> \$320 (DISKLESS)   <a href="http://www.asustor.com">www.asustor.com</a> This two-bay NAS offers excellent features, and can double as a media player via XBMC and HDMI-output.	 <b>[ BEST PREMIUM ]</b> <b>Synology DS414j</b> \$440 (DISKLESS)   <a href="http://www.synology.com">www.synology.com</a> If you need more space, this four-bay unit runs Synology's excellent NAS OS, which lets you add features via apps.	 <b>NEW ENTRY</b> <b>ASUSTOR AS3102T</b> \$370 (DISKLESS)   <a href="http://www.asustor.com">www.asustor.com</a> The newer version of the AS-202TE (left), with enough grunt for 4K media playback and transcoding.
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 <p><b>[ BEST BUDGET ]</b> <b>Creative Muvo Mini</b></p> <p>\$70   <a href="http://au.creative.com">au.creative.com</a> This Bluetooth speaker is compact and waterproof but still delivers great sound. Nicely priced, too.</p>	 <p><b>[ BEST VALUE ]</b> <b>Klipsch GiG</b></p> <p>\$200   <a href="http://www.klipsch.com.au">www.klipsch.com.au</a> A portable speaker that punches well above its weight in terms of sound quality and isn't overly costly.</p>	 <p><b>[ BEST PERFORMANCE ]</b> <b>Lenovo PlayLink 4</b></p> <p>\$399   <a href="http://www.amberonline.com.au">www.amberonline.com.au</a> With an optional battery for portable play, this Bluetooth and Wi-Fi speaker is highly versatile and sounds fantastic.</p>	 <p><b>[ NEW ON SHELF ]</b> <b>Bose SoundTouch 10</b></p> <p>\$300   <a href="http://www.bose.com.au">www.bose.com.au</a> Bose's entry into the modular streaming speaker-system is surprisingly affordable. Review forthcoming.</p>
 <p><b>[ BEST BUDGET ]</b> <b>Shure SRH440</b></p> <p>\$130   <a href="http://www.jands.com.au">www.jands.com.au</a> Bright, clear sound and great bang for buck.</p>	 <p><b>[ BEST VALUE ]</b> <b>Audio-Technica ATH-M50X</b></p> <p>\$199   <a href="http://www.audio-technica.com.au">www.audio-technica.com.au</a> A well-priced set of over-ear headphones with fantastic audio and detachable cables.</p>	 <p><b>[ BEST PREMIUM ]</b> <b>Sennheiser Momentum</b></p> <p>\$300   <a href="http://en-au.sennheiser.com">en-au.sennheiser.com</a> These over-ear cans offer fantastically rich audio that's great for most music types. Real crowd-pleasers.</p>	 <p><b>[ BEST WIRELESS ]</b> <b>Plantronics BackBeat Pro</b></p> <p>\$300   <a href="http://www.plantronics.com/au">www.plantronics.com/au</a> This Bluetooth set of cans blew us away with their great acoustics and noise-cancelling capabilities.</p>
 <p><b>[ BEST BUDGET ]</b> <b>Google Chromecast</b></p> <p>\$50   <a href="http://play.google.com">play.google.com</a> Google's wireless HDMI dongle streams content to your TV via the Play Store and a variety of third-party apps.</p>	 <p><b>[ BEST VALUE ]</b> <b>Western Digital WD TV Live</b></p> <p>\$120   <a href="http://www.wdc.com">www.wdc.com</a> It beats many TVs for video format support and its fast processor supports 1080p network streaming.</p>	 <p><b>[ BEST PERFORMANCE ]</b> <b>Western Digital WD TV Live Hub 1TB</b></p> <p>\$230   <a href="http://www.wd.com">www.wd.com</a> A media player done right, this unit can play and serve video to other devices. Easy to use and well-featured.</p>	 <p><b>NEW ENTRY</b> <b>Telstra TV</b></p> <p>\$110   <a href="http://www.telstra.com.au">www.telstra.com.au</a> Telstra's rebranded Roku 2 media streamer supports many Aussie streaming services and is reasonably priced.</p>
 <p><b>[ BEST VALUE ]</b> <b>Epson EB-W120</b></p> <p>\$580   <a href="http://www.epson.com.au">www.epson.com.au</a> This compact 3LCD, WXGA unit has good features and image quality and decently priced lamps.</p>	 <p><b>[ BEST PORTABLE ]</b> <b>Optoma ML550</b></p> <p>\$1,130   <a href="http://www.amberonline.com.au">www.amberonline.com.au</a> This pico projector fits in the palm of your hand and delivers a respectable 500 ANSI lumens brightness.</p>	 <p><b>[ BEST HOME THEATRE ]</b> <b>BenQ W1070</b></p> <p>\$999   <a href="http://www.benq.com.au">www.benq.com.au</a> BenQ's latest 1080p home theatre unit boasts a lower price and longer lamp life than the W1100.</p>	 <p><b>[ NEW ON SHELF ]</b> <b>LG MiniBeam PG60</b></p> <p>\$999   <a href="http://www.lg.com/au">www.lg.com/au</a> This compact and portable home-theatre projector will go anywhere, though its not high specced.</p>
 <p><b>NEW ENTRY</b> <b>Sony KDL32W700C</b></p> <p>\$600   <a href="http://www.sony.com.au">www.sony.com.au</a> Need a small and inexpensive TV? This 32-inch 1080p model focuses on providing great picture quality.</p>	 <p><b>NEW ENTRY</b> <b>Samsung UA40J6200</b></p> <p>\$998   <a href="http://www.samsung.com/au">www.samsung.com/au</a> A 40-inch set that has excellent detail and colour accuracy, plus low input lag making it great for gaming.</p>	 <p><b>NEW ENTRY</b> <b>Samsung UA55JU7000</b></p> <p>\$2,200   <a href="http://www.samsung.com/au">www.samsung.com/au</a> This LED-backlit 55-incher delivers an excellent combination of 4K visuals and a reasonable price.</p>	 <p><b>NEW ENTRY</b> <b>LG 55EG960T</b></p> <p>\$4,500   <a href="http://www.lg.com/au">www.lg.com/au</a> LG's 55-inch OLED 4K set basically blows the competition away... though you can find non-OLED competitors for much less.</p>
 <p><b>[ BEST BUDGET ]</b> <b>Asus F553MA-XX1151T</b></p> <p>\$449   <a href="http://www.asus.com/au">www.asus.com/au</a> Covers the basics, with a 15.6-inch screen, Pentium CPU, 4GB RAM and a 500GB hard drive for a nice price.</p>	 <p><b>[ BEST ULTRABOOK ]</b> <b>Apple MacBook Air 13-inch</b></p> <p>FROM \$1,399   <a href="http://www.apple.com/au">www.apple.com/au</a> This thin, lightweight unit has an aluminium unibody chassis, fast CPU and is well-priced for an ultrabook.</p>	 <p><b>[ BEST PERFORMANCE ]</b> <b>ASUS G751JT</b></p> <p>\$2,499   <a href="http://www.asus.com/au">www.asus.com/au</a> This unashamedly huge 17-inch desktop replacement packs heaps of power and a GTX 970M GPU.</p>	 <p><b>[ NEW ON SHELF ]</b> <b>Venom BlackBook 17 (2015)</b></p> <p>\$3,899   <a href="http://www.venomcomputers.com.au">www.venomcomputers.com.au</a> A monstrous high-performance laptop with a price to match, but the build-quality and performance are first-class.</p>

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↓	↓	↓	↓	 <p>[ BEST WINDOWS ] <b>Microsoft Lumia 635</b></p> <p>\$180   <a href="http://www.nokia.com">www.nokia.com</a> A simple and elegant WP8 handset with 4G. A solid entry-level choice.</p>	 <p>[ BEST BIG SCREEN ] <b>Motorola Moto G (2014)</b></p> <p>\$269   <a href="http://www.motorola.com.au">www.motorola.com.au</a> This upgraded Moto G packs all the basics and then some; dual-SIM 3G, 5-inch 720p LCD and 8GB storage.</p>	 <p>NEW ENTRY [ BEST PERFORMANCE ] <b>Oppo R7</b></p> <p>\$449 (16GB)   <a href="http://www.oppo.com">www.oppo.com</a> This Android-powered unit has a 5-inch IPS 1080p display, fast performance and a stylish design.</p>	 <p>[ NEW ON SHELF ] <b>Motorola Moto G (2015)</b></p> <p>\$369   <a href="http://www.motorola.com/au">www.motorola.com/au</a> Much like it's predecessor (left), but with faster internals, waterproofing and 4G support.</p>	↓
				 <p>[ BEST BUDGET ] <b>Motorola Moto X (2014)</b></p> <p>\$550 (16GB)   <a href="http://www.motorola.com/au">www.motorola.com/au</a> An excellent 5.2-inch all-rounder with frequent OS updates. Shop around for the best price.</p>	 <p>[ BEST BIG SCREEN ] <b>Samsung Galaxy Note 5</b></p> <p>From \$1,099   <a href="http://www.samsung.com/au">www.samsung.com/au</a> Samsung's fifth Note adds a sleek new metal chassis, glass front and back but keeps the great 5.7-inch AMOLED screen.</p>	 <p>[ BEST PREMIUM ] <b>Apple iPhone 6S</b></p> <p>From \$1,079   <a href="http://www.apple.com/au">www.apple.com/au</a> Basically the same as last year's, but includes a pressure-sensitive '3D Touch' display, better camera and faster internals.</p>	 <p>[ NEW ON SHELF ] <b>LG G4</b></p> <p>From \$869   <a href="http://www.lg.com/au">www.lg.com/au</a> The new LG flagship phablet includes a stunning 5.5-inch display and optional leather back.</p>	
				 <p>[ BEST BUDGET ] <b>Samsung Galaxy Tab 4 8.0</b></p> <p>\$240 (16GB)   <a href="http://www.samsung.com/au">www.samsung.com/au</a> It's getting a little long in the tooth, but this 8-inch quad-core Android tablet is our current budget pick.</p>	 <p>[ BEST COMPACT ] <b>Apple iPad mini 2</b></p> <p>\$369 (16GB)   <a href="http://www.apple.com/au">www.apple.com/au</a> With a Retina display, the iPad mini 2 is fantastic value if you want a small tablet with all the frills.</p>	 <p>[ BEST PERFORMANCE ] <b>Apple iPad Air</b></p> <p>\$499   <a href="http://www.apple.com/au">www.apple.com/au</a> This iPad recently saw a \$100 price drop, which makes it the best-performing tablet under \$500.</p>	 <p>[ NEW ON SHELF ] <b>Microsoft Surface 3</b></p> <p>\$699 (64GB)   <a href="http://www.microsoft.com">www.microsoft.com</a> A lower-end, Intel Atom-powered alternative to the Surface Pro, but still runs the full version of Windows.</p>	
				 <p>[ BEST BUDGET ] <b>Apple iPad Air</b></p> <p>\$499   <a href="http://www.apple.com/au">www.apple.com/au</a> It may be two years old, but the iPad Air is the best-performing tablet at this \$500 price.</p>	 <p>NEW ENTRY [ BEST VERSATILITY ] <b>Microsoft Surface Pro 4</b></p> <p>From \$1,349   <a href="http://www.microsoftstore.com">www.microsoftstore.com</a> This official Windows 10 tablet has a great stylus and runs traditional Windows software.</p>	 <p>[ BEST PERFORMANCE ] <b>Apple iPad Air 2</b></p> <p>From \$619   <a href="http://www.apple.com/au">www.apple.com/au</a> The second-gen iPad Air goes even slimmer and lighter than before and has unbelievably fast internals.</p>	 <p>NEW ENTRY [ NEW ON SHELF ] <b>Apple iPad Pro</b></p> <p>From \$1,249   <a href="http://www.apple.com/au">www.apple.com/au</a> Apple's take on the 2-in-1 is a 12.9-inch iPad with optional stylus and keyboard cover. For designers only at this point.</p>	
↓	↓	↓	↓	 <p>[ BEST FOR IPAD 2/3/4 ] <b>Logitech Keyboard Case for iPad</b></p> <p>\$90   <a href="http://www.logitech.com">www.logitech.com</a> Offers good protection and comfy, responsive keys on a budget.</p>	 <p>[ BEST FOR IPAD AIR ] <b>Belkin QODE Slim Keyboard Case</b></p> <p>\$110   <a href="http://www.belkin.com/au">www.belkin.com/au</a> A great keyboard and vibrant case with a kickstand make this a great option for iPad Air.</p>	 <p>[ BEST FOR IPAD MINI ] <b>Logitech Ultrathin Keyboard Cover</b></p> <p>\$90   <a href="http://www.logitech.com">www.logitech.com</a> The Ultrathin combines a fantastic-quality keyboard with a metal-backed case.</p>	 <p>[ BEST FULL-SIZED KEYBOARD ] <b>Logitech Tablet Keyboard</b></p> <p>\$120   <a href="http://www.logitech.com">www.logitech.com</a> If you want the full-sized typing experience, this is your best bet.</p>	
				 <p>[ BEST BUDGET ] <b>Nikon CoolPix S3300</b></p> <p>\$150   <a href="http://www.nikon.com.au">www.nikon.com.au</a> This compact camera is available in eight colours and has an ultra-slim body with 6x wide-angle lens.</p>	 <p>[ BEST COMPACT SLR ] <b>Olympus OM-D E-M10</b></p> <p>\$850 (14–42mm LENS)   <a href="http://www.olympus.com.au">www.olympus.com.au</a> A MILC with lots of lenses, fast shooting and a high-res viewfinder at a great price.</p>	 <p>[ BEST DIGITAL SLR ] <b>Sony Alpha SLT-A65</b></p> <p>\$1,110   <a href="http://www.sony.com.au">www.sony.com.au</a> A fantastic prosumer camera that lives up to its great specs.</p>	 <p>[ NEW ON SHELF ] <b>Canon EOS 750D</b></p> <p>\$980   <a href="http://www.canon.com.au">www.canon.com.au</a> This beginner's DSLR is a great place to learn the intricacies of pro shooting (and for a fair price).</p>	





 <p>[ BEST POWER BANK ] <b>TP-Link TL-PB10400</b></p> <p>\$50   <a href="http://www.tp-link.com.au">www.tp-link.com.au</a> This 10,400mAh power bank will let you recharge your smartphone or tablet anywhere and weighs just 241g.</p>	 <p>[ BEST WIRELESS HARD DRIVE ] <b>WD My Passport Wireless 2TB</b></p> <p>\$330   <a href="http://www.wd.com">www.wd.com</a> Take your media collection with you and play it back from Android and iOS devices with this Wi-Fi hard drive.</p>	 <p>[ BEST STYLUS ] <b>Adonit Jot Pro</b></p> <p>\$45   <a href="http://www.adonit.net">www.adonit.net</a> This one's great for scribbling notes on Android and iOS tablets and doesn't cost the Earth.</p>	 <p>[ BEST MOBILE GAMEPAD ] <b>iPega PG-9025</b></p> <p>~\$25   <a href="http://www.dx.com">www.dx.com</a> You'll need to buy it online, but this gamepad is nice and responsive, and works with both iOS and Android.</p>
 <p>[ BEST BUDGET ] <b>Toshiba Canvio Basics 1TB</b></p> <p>\$90   <a href="http://www.toshiba.com">www.toshiba.com</a> A compact portable hard drive with USB 2.0, 3.0 and backward compatibility.</p>	 <p>[ BEST VALUE ] <b>Western Digital My Passport Ultra 2TB</b></p> <p>\$149   <a href="http://www.wd.com">www.wd.com</a> Great value, with lots of storage, good software and USB 3.0 support.</p>	 <p>[ BEST PERFORMANCE ] <b>Seagate Backup Plus Fast 4TB</b></p> <p>\$400   <a href="http://www.seagate.com">www.seagate.com</a> This speedy USB 3.0 drive transfers data at up to 220MB/s — twice as fast as most others.</p>	 <p>[ NEW ON SHELF ] <b>Western Digital My Passport Ultra 3TB</b></p> <p>\$280   <a href="http://www.wd.com">www.wd.com</a> A big-capacity drive that isn't too bulky to take with you. The price is decent too.</p>
 <p>[ BEST SMARTWATCH FOR ANDROID ] <b>LG G Watch R</b></p> <p>\$349   <a href="http://www.play.google.com/devices">www.play.google.com/devices</a> The G Watch R runs Android Wear and, best of all, it actually looks like a watch.</p>	 <p>[ BEST SMARTWATCH FOR IOS ] <b>Pebble Time</b></p> <p>US\$200   <a href="http://www.getpebble.com">www.getpebble.com</a> This new colour e-paper smartwatch has great battery life and one of the most mature app ecosystems.</p>	 <p>[ BEST FITNESS BAND ] <b>Fitbit Charge HR</b></p> <p>\$200   <a href="http://www.fitbit.com">www.fitbit.com</a> This top-end tracker from Fitbit's latest range offers heart-rate tracking and a handy display for a fair price.</p>	 <p>[ BEST EXERCISE HEADPHONES ] <b>Jabra Sport Pulse Wireless</b></p> <p>\$250   <a href="http://www.jabra.com">www.jabra.com</a> These in-ear buds connect to your phone via Bluetooth and have integrated heart-rate monitoring.</p>
 <p>[ BEST BUDGET ] <b>Dell S2340L</b></p> <p>\$230   <a href="http://www.dell.com.au">www.dell.com.au</a> A solid all-rounder, this 23-inch IPS display has deep colours and a nice narrow bezel.</p>	 <p>[ BEST VALUE ] <b>Dell P2714H</b></p> <p>\$440   <a href="http://www.dell.com.au">www.dell.com.au</a> This quality 27-inch IPS unit has a resolution of 1,920 x 1,080 with an aspect ratio of 16:9.</p>	 <p>[ BEST PERFORMANCE ] <b>ASUS PG278Q</b></p> <p>\$999   <a href="http://www.asus.com/au">www.asus.com/au</a> If you're looking for the best PC gaming display right now, there's no better than this 27-inch G-sync monitor.</p>	 <p>[ NEW ON SHELF ] <b>AOC U2868PQ</b></p> <p>\$640   <a href="http://www.aocmonitorap.com">www.aocmonitorap.com</a> AOC's 28-inch TN panel at 3,840 x 2,160 is the cheapest 4K we've yet tested and great bang for buck.</p>
 <p>[ BEST BUDGET ] <b>Tt eSports Poseidon ZX</b></p> <p>\$99   <a href="http://www.au.ttesports.com">www.au.ttesports.com</a> This basic compact board still has it where it counts, with solid performance and comfortable keys.</p>	 <p>[ BEST VALUE ] <b>Logitech G710+</b></p> <p>\$130   <a href="http://www.logitech.com">www.logitech.com</a> This brown switched mechanical gaming keyboard is comparatively quiet and has great key feel.</p>	 <p>[ BEST PREMIUM ] <b>Corsair Vengeance K95 RGB</b></p> <p>\$230   <a href="http://www.corsair.com">www.corsair.com</a> Available in multiple switch colours, the K95's backlighting can be customised in almost any shade.</p>	 <p>[ NEW ON SHELF ] <b>Razer BlackWidow Chroma</b></p> <p>\$210   <a href="http://www.razerzone.com">www.razerzone.com</a> Razer's joined the multicoloured LED club, upgrading its BlackWidow with rainbow-coloured backlighting.</p>
 <p>[ BEST BUDGET ] <b>Microsoft LifeChat LX-3000</b></p> <p>\$35   <a href="http://www.microsoft.com.au/hardware">www.microsoft.com.au/hardware</a> A cheap basic USB headset with noise-cancelling tech.</p>	 <p>[ BEST VALUE ] <b>SteelSeries Siberia V2</b></p> <p>\$80   <a href="http://www.steelseries.com">www.steelseries.com</a> Luxurious with great sound and a brilliant retractable microphone.</p>	 <p>[ BEST PERFORMANCE ] <b>Audio-Technica ATH-AG1</b></p> <p>\$349   <a href="http://www.audio-technica.com.au">www.audio-technica.com.au</a> A super-comfy headset with massive drivers and fantastic sound.</p>	 <p>[ NEW ON SHELF ] <b>Kingston HyperX Cloud II</b></p> <p>\$160   <a href="http://www.kingston.com">www.kingston.com</a> These affordable cans sound great across games, music and movies.</p>



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[ BEST BUDGET ]  
**Logitech G402 Hyperion Fury**

\$49 | [www.logitech.com](http://www.logitech.com)  
A hybrid-sensor gaming mouse with optical, gyro and accelerometer tracking, this one doesn't skip a beat.



[ BEST VALUE ]  
**Razer DeathAdder Chroma**

\$65 | [www.razerzone.com/au-en](http://www.razerzone.com/au-en)  
This super-comfy ergonomic mouse for right-handers has a great, organic-feeling sensor.



[ BEST PERFORMANCE ]  
**Razer Taipan**

\$80 | [www.razerzone.com/au-en](http://www.razerzone.com/au-en)  
A super-high-resolution gaming mouse that's actually comfortable to use.



[ NEW ON SHELF ]  
**Logitech G502 Proteus Core**

\$80 | [www.logitech.com](http://www.logitech.com)  
This surprisingly affordable new optical mouse from Logitech offers great tunability.



[ BEST BUDGET ]  
**Brother HL-L2340DW**

\$110 | [www.brother.com.au](http://www.brother.com.au)  
It's black and white only, but with Wi-Fi and great text print quality alignment, very fast print speeds and cheap to run.



[ BEST VALUE ]  
**HP Officejet Pro 6830**

\$180 | [www.epson.com.au](http://www.epson.com.au)  
A great all-rounder that's up for both photo-printing and text documents.



[ BEST PHOTO PRINTER ]  
**Epson Expression XP-720**

\$210 | [www.epson.com.au](http://www.epson.com.au)  
Creates fantastic-quality photo prints at a relatively affordable price.



[ NEW ON SHELF ]  
**Epson WorkForce Pro WP-4540**

\$449 | [www.epson.com.au](http://www.epson.com.au)  
Requires manual print head alignment, but very fast print speeds and cheap to run.



[ BEST BUDGET ]  
**Sapphire Dual-X Radeon R7 265**

\$190 | [www.sapphiretech.com](http://www.sapphiretech.com)  
This beats the similarly priced GTX 750 Ti from Nvidia for value and speed.



[ BEST VALUE ]  
**ASUS STRIX-R7370-DC20C-2GD5**

\$240 | [www.asus.com/au](http://www.asus.com/au)  
This mid-range card from AMD can run pretty much anything with all the bells and whistles at 1080p.



[ BEST PREMIUM ]  
**Gigabyte GV-N970WF30C-4GD**

\$550 | [www.gigabyte.com.au](http://www.gigabyte.com.au)  
If your budget stretches to around \$500, this new GeForce is extremely fast and great value.



[ BEST EXTREME ]  
**MSI GTX-980-4GD5**

\$780 | [www.au.msi.com](http://www.au.msi.com)  
This top-tier card from MSI and Nvidia is super speedy and what we'd select if money is no object.



[ BEST BUDGET ]  
**ASRock H97M-Anniversary**

\$99 | [www.asrock.com](http://www.asrock.com)  
Built to go with the Pentium G3258, this is a solid all-rounder for under \$100.



[ BEST VALUE ]  
**Gigabyte GA-Z170M-D3H**

\$200 | [www.gigabyte.com.au](http://www.gigabyte.com.au)  
This low-cost Z170 board has all the basics you need, including Intel LAN and 6th-Gen Core i support.



[ BEST PERFORMANCE ]  
**ASUS Z170 Pro Gaming**

\$265 | [www.asus.com/au](http://www.asus.com/au)  
A great match for the i5-6500 CPU, with a good mix of useful features at a reasonable price.



[ NEW ON SHELF ]  
**ASRock H170M Pro4**

\$160 | [www.asrock.com](http://www.asrock.com)  
This budget-board supports Intel's new 6th-Gen Core i chips, but doesn't cost a fortune. Pair it with a Core i3-6320.



[ BEST BUDGET ]  
**Intel Pentium G3258**

\$80 | [www.intel.com](http://www.intel.com)  
An extremely overclockable dual-core CPU for those looking at building a ballsy budget rig.



[ BEST VALUE ]  
**Intel Core i5-6500**

\$295 | [www.intel.com](http://www.intel.com)  
This new Skylake Core i5 chip offers great performance with low power use.



[ BEST PREMIUM ]  
**Intel Core i7-6700K**

\$520 | [www.intel.com](http://www.intel.com)  
The top chip from Intel's new 6th-Gen Core i desktops is extremely fast and overclockable.



[ NEW ON SHELF ]  
**Intel Core i3-6320**

TBA | [www.intel.com](http://www.intel.com)  
This new CPU should cost roughly \$230 when it lands, making it a solid option for gamers on a budget.



[ BEST BUDGET ]  
**OCZ Arc 100 120GB**

\$75 | [www.ocz.com](http://www.ocz.com)  
This Toshiba-made SSD is fast, reliable and very low-priced. A great option for anyone looking for a budget SSD.



[ BEST VALUE ]  
**SanDisk Ultra II 240GB**

\$125 | [www.sandisk.com](http://www.sandisk.com)  
240GB is no longer the sweet spot in terms of cost-per-gig, but this model is the best option under \$150.



[ BEST PREMIUM ]  
**SanDisk Ultra II 480GB**

\$240 | [www.sandisk.com](http://www.sandisk.com)  
This reasonably priced unit from SanDisk has heaps of space for your OS, games and critical apps.



[ BEST EXTREME ]  
**Samsung 850 EVO 1TB**

\$495 | [www.samsung.com/au](http://www.samsung.com/au)  
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